

# **INDEPENDENT ORBITER ASSESSMENT**

## **ANALYSIS OF THE COMMUNICATION AND TRACKING SUBSYSTEM**

**31 DECEMBER 1987**





MCDONNELL DOUGLAS ASTRONAUTICS COMPANY  
HOUSTON DIVISION

SPACE TRANSPORTATION SYSTEM ENGINEERING AND OPERATIONS SUPPORT

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INDEPENDENT ORBITER ASSESSMENT  
ANALYSIS OF THE COMMUNICATION AND TRACKING SUBSYSTEM

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PREPARED BY:

J.R. Gardner  
J.R. Gardner  
Analyst  
Independent Orbiter  
Assessment

PREPARED BY:

W.M. Robinson  
W.M. Robinson  
Analyst  
Independent Orbiter  
Assessment

PREPARED BY:

W.H. Trahan  
W.H. Trahan  
Analyst  
Independent Orbiter  
Assessment

PREPARED BY:

E.S. Daley  
E.S. Daley  
Lead Analyst  
Independent Orbiter  
Assessment

PREPARED BY:

W.C. Long  
W.C. Long  
Lead Analyst  
Independent Orbiter  
Assessment

APPROVED BY:

A.W. Addis  
A.W. Addis  
Subsystem Lead  
Independent Orbiter  
Assessment

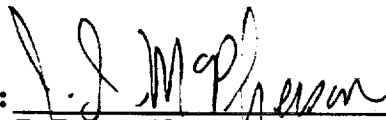
APPROVED BY:

A.J. Marino  
A.J. Marino  
Section Manager-FMEA/CIL  
Independent Orbiter  
Assessment

APPROVED BY:

G.W. Knori  
G.W. Knori  
Technical Manager  
Independent Orbiter  
Assessment

APPROVED BY:

  
J. I. McPherson  
Project Manager  
STSEOS

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Independent Orbiter Assessment  
Analysis of the Communication and Tracking Subsystem

## 1.0 EXECUTIVE SUMMARY

The McDonnell Douglas Astronautics Company (MDAC) was selected in June 1986 to perform an Independent Orbiter Assessment (IOA) of the Failure Modes and Effects Analysis (FMEA) and Critical Items List (CIL). Direction was given by the STS Orbiter and GFE Projects Office to perform the hardware analysis using the instructions and ground rules defined in NSTS 22206, Instructions for Preparation of FMEA and CIL, 10 October 1986, with changes 1, 2, 3, and 4, through 23 November 1987. The IOA approach features a top-down analysis of the hardware to determine failure modes, criticality, and potential critical items. To preserve independence, this analysis was accomplished without reliance upon the results contained within the NASA FMEA/CIL documentation. This report documents (Appendix C) the independent analysis results corresponding to the Orbiter Communication and Tracking hardware.

The IOA analysis process utilized available Communication and Tracking hardware drawings and schematics for defining hardware assemblies, components, and hardware items. Each level of hardware was evaluated and analyzed for possible failure modes and effects. Criticality was assigned based upon the severity of the effect for each failure mode.

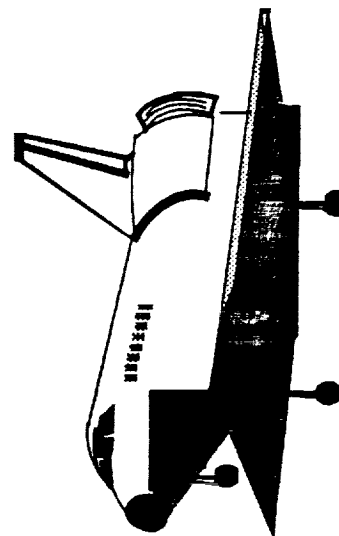
Figure 1 presents a summary of the failure criticalities for each of the twelve major subdivisions of the Communication and Tracking. A summary of the number of failure modes, by criticality, is also presented below with Hardware (HW) criticality first and Functional (F) criticality second.

Summary of IOA Failure Modes By Criticality (HW/F)							
Criticality :	1/1	2/1R	2/2	3/1R	3/2R	3/3	TOTAL
Number :	5	149	51	189	239	406	1,039

# COMMUNICATIONS AND TRACKING OVERVIEW ANALYSIS SUMMARY

COMMUNICATIONS & TRACKING SUBSYSTEM		
CRIT.	#FM	#PCI
1/1	5	5
2/1R	149	149
2/2	51	53
3/1R	189	24
3/2R	239	40
3/3	406	0

COMMUNICATIONS		
CRIT.	#FM	#PCI
1/1	5	5
2/1R	149	149
2/2	30	30
3/1R	159	24
3/2R	239	40
3/3	400	0



TRACKING (NAVAIDS)		
CRIT.	#FM	#PCI
1/1	0	0
2/1R	0	0
2/2	21	21
3/1R	30	0
3/2R	0	0
3/3	6	0

EXPANDED IN  
FIGURE 1.1B

EXPANDED IN  
FIGURE 1.1C

Figure 1.1a - COMMUNICATION AND TRACKING OVERVIEW ANALYSIS SUMMARY

# COMMUNICATIONS OVERVIEW ANALYSIS SUMMARY - EXPANDED

## COMMUNICATIONS

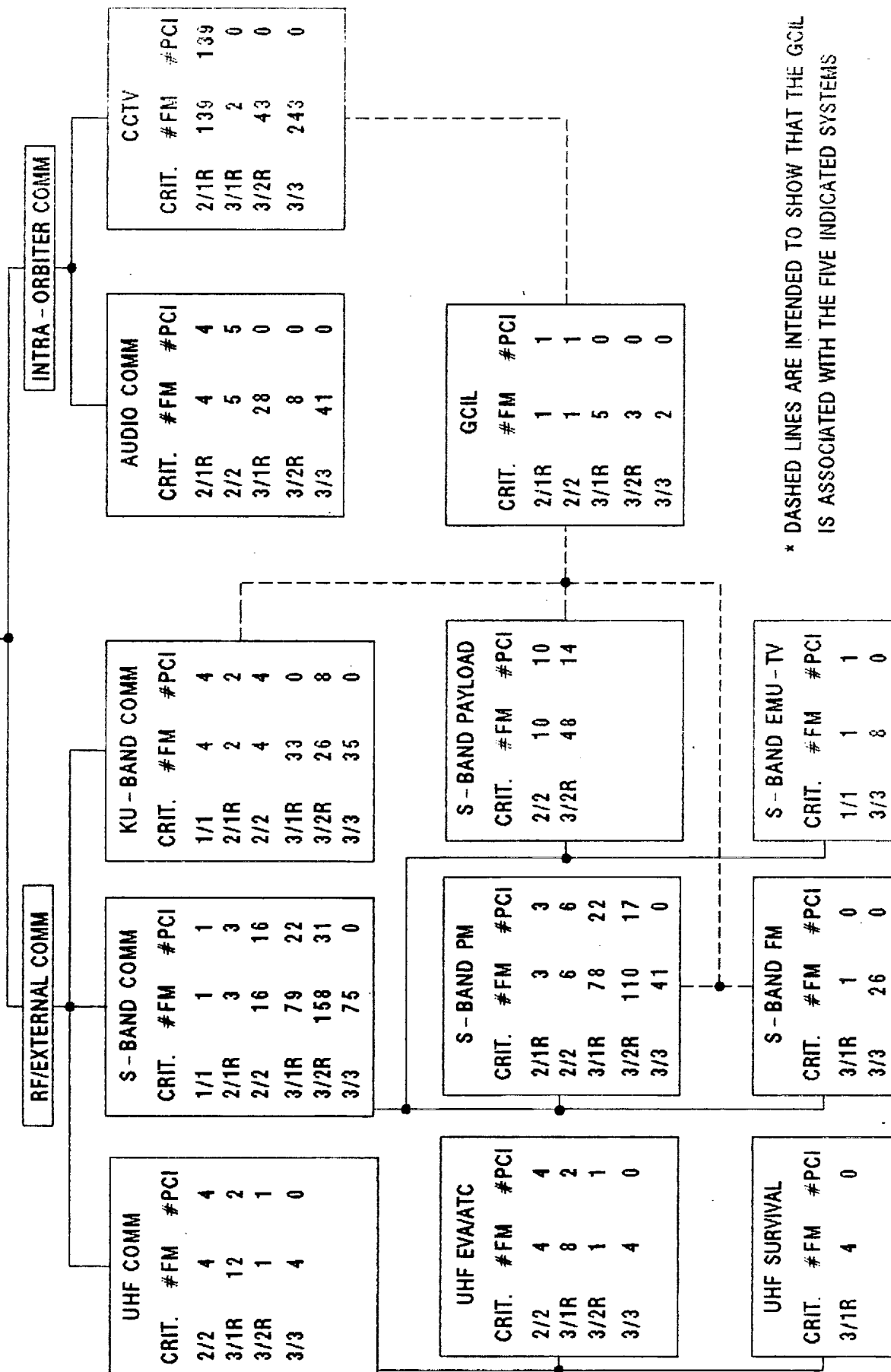


Figure 2 - COMMUNICATIONS OVERVIEW ANALYSIS SUMMARY - EXPANDED

# TRACKING OVERVIEW ANALYSIS SUMMARY - EXPANDED

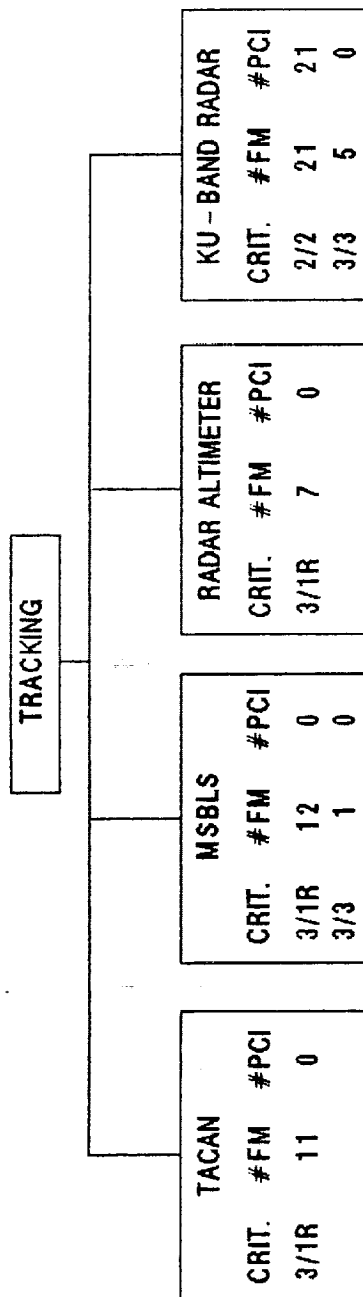


Figure 1.1c - TRACKING OVERVIEW ANALYSIS SUMMARY - EXPANDED



For each failure mode identified, the criticality and redundancy screens were examined to identify critical items. A summary of Potential Critical Items (PCIs) is presented as follows:

Summary of IOA Potential Critical Items (HW/F)						
Criticality :	1/1	2/1R	2/2	3/1R	3/2R	TOTAL
Number :	5	149	51	24	40	269

## **2.0 INTRODUCTION**

### **2.1 Purpose**

The 51-L Challenger accident prompted the NASA to readdress safety policies, concepts, and rationale being used in the National Space Transportation System (NSTS). The NSTS Office has undertaken the task of reevaluating the FMEA/CIL for the Space Shuttle design. The MDAC is providing an independent assessment of the Orbiter FMEA/CIL reevaluation results for completeness and technical accuracy.

### **2.2 Scope**

The scope of the independent FMEA/CIL assessment activity encompasses those Shuttle Orbiter subsystems and GFE hardware identified in the Space Shuttle Independent FMEA/CIL Assessment Contractor Statement of Work. Each subsystem analysis addresses hardware, functions, internal and external interfaces, and operational requirements for all mission phases.

### **2.3 Analysis Approach**

The independent analysis approach is a top-down analysis utilizing as-built drawings to breakdown the respective subsystem into components and low-level hardware items. Each hardware item is evaluated for failure mode, effects, and criticality. These data are documented in the respective subsystem analysis report, and are used to assess the NASA and Prime Contractor FMEA/CIL reevaluation results. The IOA analysis approach is summarized in the following Steps 1.0 through 3.0. Step 4.0 summarizes the assessment of the NASA and Prime Contractor FMEAs/CILs that is performed and documented at a later date.

#### **Step 1.0 Subsystem Familiarization**

- 1.1 Define subsystem functions**
- 1.2 Define subsystem components**
- 1.3 Define subsystem specific ground rules and assumptions**

#### **Step 2.0 Define subsystem analysis diagram**

- 2.1 Define subsystem**
- 2.2 Define major assemblies**
- 2.3 Develop detailed subsystem representations**

#### **Step 3.0 Failure events definition**

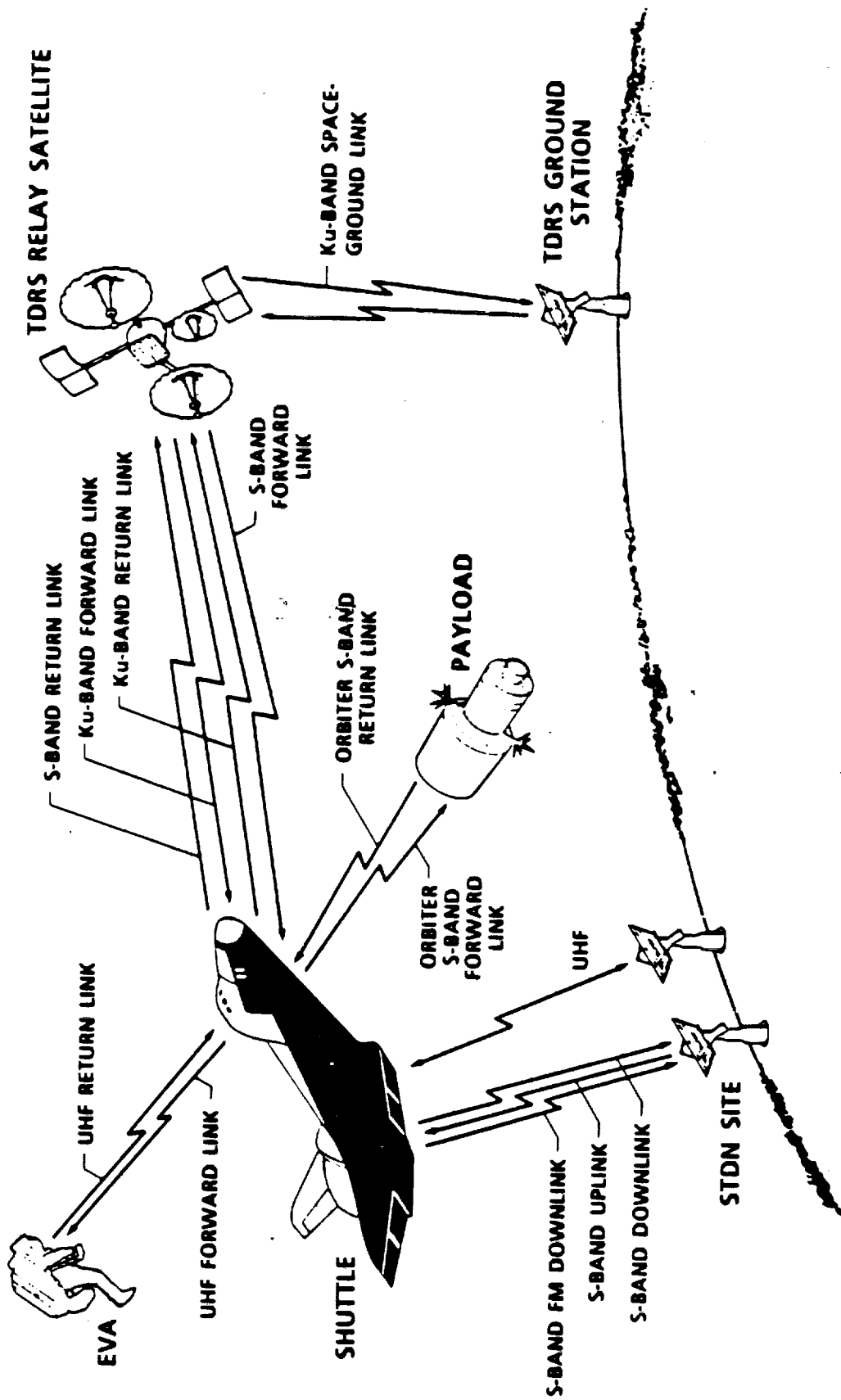
- 3.1 Construct matrix of failure modes**
- 3.2 Document IOA analysis results**

Step 4.0 Compare IOA analysis data to NASA FMEA/CIL

- 4.1 Resolve differences
- 4.2 Review in-house
- 4.3 Document assessment issues
- 4.4 Forward findings to Project Manager

## **2.4 Communication and Tracking Ground Rules and Assumptions**

The Communication and Tracking ground rules and assumptions used in the IOA are defined in Appendix B.



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Figure 3.1 - COMMUNICATIONS AND TRACKING SUBSYSTEM PICTORAL

### 3.0 SUBSYSTEM DESCRIPTION

#### 3.1 Design and Function

The Communication and Tracking Subsystem consists of all hardware required for ground communication, crew station communication, attached and detached payload communication, Ground Command Interface Logic (GCIL) commands, video, audio, and coded telemetry transmission and reception, and state vector updates. See figure 3.1. Electrical power distribution has been included where it meets the criteria established in NSTS 22206 for evaluation of each individual subsystem. Refer to Figures 3.2 through 3.21 for the location of each ORBITER subsystem and related Block Diagram. The following specific subsystem functions are included:

1. S-band Phase Modulation (PM) RF links provide two way communication either direct with NASA or DOD ground stations or via the Tracking and Data Relay Satellite (TDRS), for the following: commands, real time telemetry data, two way voice communication, teleprinter data, tone ranging (direct links only), and doppler tracking. Network Signal Precursor functions are included in the S-Band PM system analysis. See Figure 3.5.
2. The S-band Frequency Modulation (FM) system provides for data transmission direct to ground. This FM signal can be modulated by selectable (one at a time): real time main engine (ME) data during launch, real time or playback Closed Circuit Television (CCTV) video, real time attached payload data, playback of Operations Recorder (telemetry and/or voice data), or playback of payload recorder digital data. See Figure 3.6.
3. Detached Payload two-way communication is via S-band payload system. This system provides a forward link (to the payload) for commands and a return link (from the payload) for telemetry. See Figure 3.7.
4. The Ku-band system is used for either two-way communications via the Tracking and Data Relay Satellite (TDRS) or for radar operations, but not simultaneously. The Ku-band forward link can transmit commands, voice, and forward data link either for text and graphics (TAGS) or for DOD commands via the communications interface unit (CIU). The return link provides capability for transmission of voice, telemetry, and TV video. The Ku-band system can be used only with payload bay doors open, during on-orbit operations. See Figures 3.8 and 3.18.
5. The UHF communication system provides voice communication between the Orbiter and ground stations, between the Orbiter and Astronauts on EVA, and distress (Guard) function on the international distress frequency. In the EVA mode. it can be used for duplex voice between Orbiter and up to two EVA

crewmembers, and for transmission of biomedical data to the Orbiter which can be interleaved with operational data downlinked to ground. UHF is also used for communication with Air Traffic Control (ATC) and chase aircraft during landing operations. The UHF amplitude modulation (AM) transceiver is capable of operation in four major modes and on four different frequencies. By selecting or bypassing the power amplifier, it will operate at 10 watts or 0.25 watts. See Figure 3.9.

6. The Audio Distribution System (ADS) gathers audio signals from multiple sources and routes them throughout the Orbiter. Through these eight audio loops, the crewmembers are able to communicate with each other, with Ground through access with external rf link equipment, with payloads or other spacecraft, or astronauts on EVA. Caution and Warning audio signals are passed through the audio system, as are TACAN ground station coded signals. Equipment included in the ADS are the Audio Central Control Unit (ACCU), Audio Terminal Units (ATU), Speaker Microphone Units (SMU), Audio Center, and Crew Communications Umbilical (CCU) jack. See Figures 3.10 through 3.13.
7. Navigation Aids include three Tactical Air Navigation (TACAN) receivers operating in a redundant set mode, two independent Radar Altimeters (RA) for low altitude terrain tracking and altitude sensing, and the Microwave Scan Beam Landing System (MSBLS), which is a Ku-band receiver-transmitter landing and navigation aid with decoding and computational capabilities. The Ku-band system can be used in its radar mode for rendezvous operations. See Figures 3.14 through 3.20.
8. Closed Circuit Television (CCTV) is provided to support on-orbit activities. Monitors are provided for the Orbiter crew to observe select activities. Cameras may be controlled by ground control or by panel controls. TV video can be downlinked by either Ku-band or S-band FM.
9. Crew Equipment/Government Furnished Equipment (GFE) includes the following items which have been included in this analysis: Comm Carrier Electronics Module, Interim Teleprinter, Interim Video Tape Recorder (VTR), Headset Interface Unit (HIU), Headset Cables, Wireless Crew Communication System (WCCS), Audio Central Control Unit (ACCU) bypass, Very Lightweight Headset, handheld microphone, multiple headset adapter, PRC-90 hand-held beacon/voice transceiver, and AN/URT-33 RF beacon transmitter.
10. EMU TV provides video scenes selected by the EVA helmet mounted camera. The scenes are transmitted by S-band FM transmissions to the Orbiter for distribution in the Orbiter CCTV system.
11. The GCIL controller provides the capability of controlling selected subsystem functions in either the PANEL or COMMAND

mode. In the PANEL mode, selected subsystems are under control of the manual Displays and Controls (D&C) panel switches; in the COMMAND mode these subsystems are controlled by uplinked ground commands or commands entered via the Orbiter keyboards. There are five PANEL/ COMMAND mode switches to control given functions of the following systems: S-band PM, S-band FM, CCTV, Ku-band, and S-band Payload. See Figure 3.21.

TABLE I COMMUNICATIONS AND TRACKING EQUIPMENT LOCATIONS

NOMENCLATURE	COMMUNICATIONS	USE/INSTALLED LOCATION
S-Band PM System		
Transponder		Avionics Bay 3A
Power Amplifier (2, one encl)		Avionics Bay 3A
Preamplifier (2, one encl)		Avionics Bay 3A
Panel Control Switches		Panel A1
GCIL Command/Panel Switch		Panel C3
Antenna Switch/Beam Switch		Avionics Bay 3A
Manual Quad Antenna Switch		Panel C3
Quad Antennas (4)		Forward Fuselage
Network Signal Processor (2)		Avionics Bay 3A
S-Band FM System		
Transmitter (2)		Avionics Bay 3A
Signal Processor (2, one encl)		Avionics Bay 3A
Panel Control Switches		Panel A1
RF Transfer Switch		Avionics Bay 3A
Antenna Switch		Avionics Bay 3A
Hemi Antennas (2)		Upper, Lower Centerline, Cabin Area
S-Band Payload System		
Payload Interrogator (2)		Avionics Bay 2
Signal Processor (2)		Avionics Bay 2
Panel Control Switches		Panel A1
Antenna		Upper Centerline, Cabin Area
Ku-Band Communications System		
EA1-Comm Data Processor, Antenna Control		Avionics Bay 3A
EA2-Radar Data Processor		Avionics Bay 3A
Signal Processor Assembly		Avionics Bay 3A
Deployed Assembly (RF, Antenna Gimbals, Gyro Assembly)		Right Sill Longeron, behind cabin
Panel Control Switches		Panel A1, Panel ML86B, Panel R13
Jettison Controls		Panel ML86B, Panel A14
Audio System		
Audio Control Unit (2, one encl)		Avionics Bay 1
Audio 1/2 Power Switch		Panel C3
Audio Termination Units, Panel Controls		Various Crew Stations
Crew Equipment (Headsets, etc.)		Various Orbiter Locations



UHF EVA/ATC System  
Transceiver  
EVA Transceivers  
Panel Controls  
UHF Antenna, External  
  
UHF Antenna, Internal

Avionics Bay 3A  
Payload Bay EVA Locations  
Panel 06, Panel A1  
Lower Centerline,  
Cabin Area  
Airlock

GCIL  
Logic Modules, Drivers  
GCIL Panel/Command Switches

Avionics Bay 3A  
Panel C3 (S-Band PM/NSP)  
Panel A1 (S-Band FM,  
Payload, Ku-Band)

CCTV  
CCTV Monitors  
Panel Control Switches

Aft Flight Deck  
Panel A7, Panel L12,  
Panel R11, Payload  
Bay, Various  
Locations in Orbiter

EMU TV  
EMU TV Camera/S-Band Transmtr,  
Antenna, Battery Pack  
EMU TV Receiver, Video  
Processing Unit, RF Cables

Crewman Helmet/Suit,  
Various EVA Locations  
Middeck

Text and Graphics System (TAGS)  
TAGS Hard Copier

Avionics Bay 3B

**TABLE II COMMUNICATIONS AND TRACKING EQUIPMENT LOCATIONS**

<b>NOMENCLATURE</b>	<b>TRACKING/NAVAIDS</b>	<b>USE/INSTALLED LOCATION</b>
TACAN System		
TACAN LRU (3)		Avionics Bay 1 (one) Bay 2 (one) Bay 3A (one)
TACAN Panel Control Switches		Panel 07
TACAN Antenna (3)		Upper Fuselage, Nose
TACAN Antenna (3)		Lower Fuselage, Nose
MSBLS		
MSBLS RF Assembly (3)		Avionics Bay 1 (one), Bay 2 (two)
MSBLS Decoder Assembly (3)		Avionics Bay 1 (one), Bay 2 (two)
MSBLS Antenna (3)		Upper Fuselage, Nose
MSBLS Panel Control Switches		Panel 08
RADAR ALTIMETER System		
RADAR ALTIMETER LRU (2)		Avionics Bay 1, Avionics Bay 2
Panel Control Switches		Panel 08
Antenna		Lower Forward Fuselage
Ku-BAND RADAR System		
EA1- Comm data processor, ant control		Avionics Bay 3A
EA2- Radar data processor		Avionics Bay 3A
Deployed Assembly (RF, Antenna, Gimbals, Gyro Assembly)		Right Sill Longeron, behind cabin
Panel Control Switches		Panel A1, Panel ML86B, Panel R13
Jettison Controls		Panel ML86B, Panel A14

### **3.2 Interfaces and Locations**

Various parts of the Communication and Tracking Subsystem are located throughout the Orbiter. S-band quad antennae are positioned on the forward upper and lower fuselage on the starboard and port sides. S-band hemi antennae are centered directly above and below the flight deck, with the payload antenna behind the upper hemi antenna. (Figure 3.20) The Ku-band antenna is mounted at the forward starboard sill longeron. (Figure 3.18) The three TACAN LRUs each have an upper and lower antenna, mounted in front of the flight deck windows and directly below that location on the lower fuselage. (Figure 3.19) MSBLS antennae are on the upper forward nose, in front of the TACAN antennae location. (Figure 3.17) The Radar Altimeter antennae is mounted on the lower nose, close to the nose wheel bay. (Figure 3.17)

Avionics bays 1, 2, 3A, and 3B contain the individual LRUs for each of the systems analyzed herein. Panel controls for each of the systems are located on the various panels on the Flight Deck, Aft Station, Mid-deck, and other locations for mission specific panels. See Tables I and II for equipment locations.

### **3.3 Hierarchy**

Figures 3.2 through 3.4 illustrate the hierarchy of the Communication and Tracking Subsystem hardware and the corresponding subcomponents.

IOA  
COMMUNICATIONS AND TRACKING SUBSYSTEM OVERVIEW

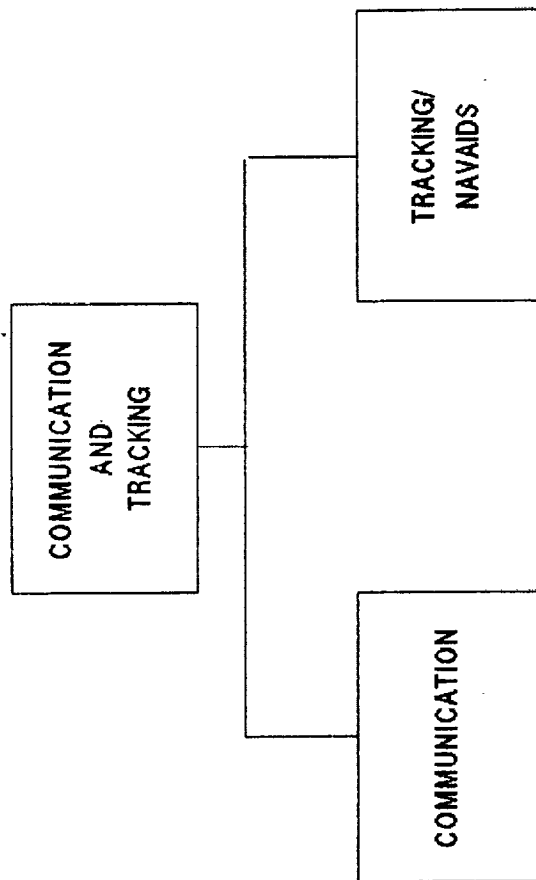


Figure 3.2 - COMMUNICATIONS AND TRACKING SUBSYSTEM OVERVIEW

# COMMUNICATIONS AND TRACKING DETAILED REPRESENTATION OVERVIEW

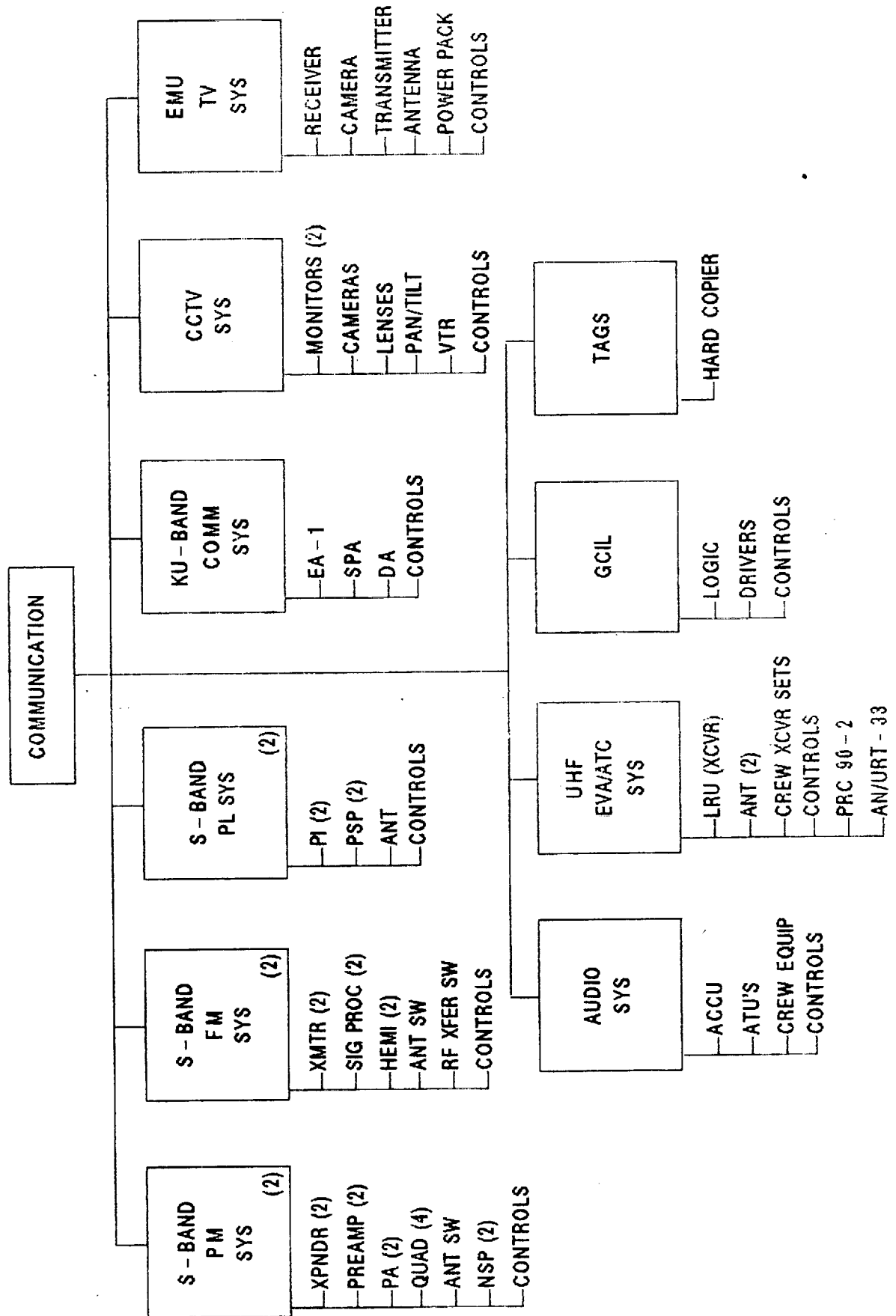


Figure 3.3 - COMMUNICATIONS SYSTEM HIERARCHY

# COMMUNICATIONS AND TRACKING DETAILED REPRESENTATION OVERVIEW

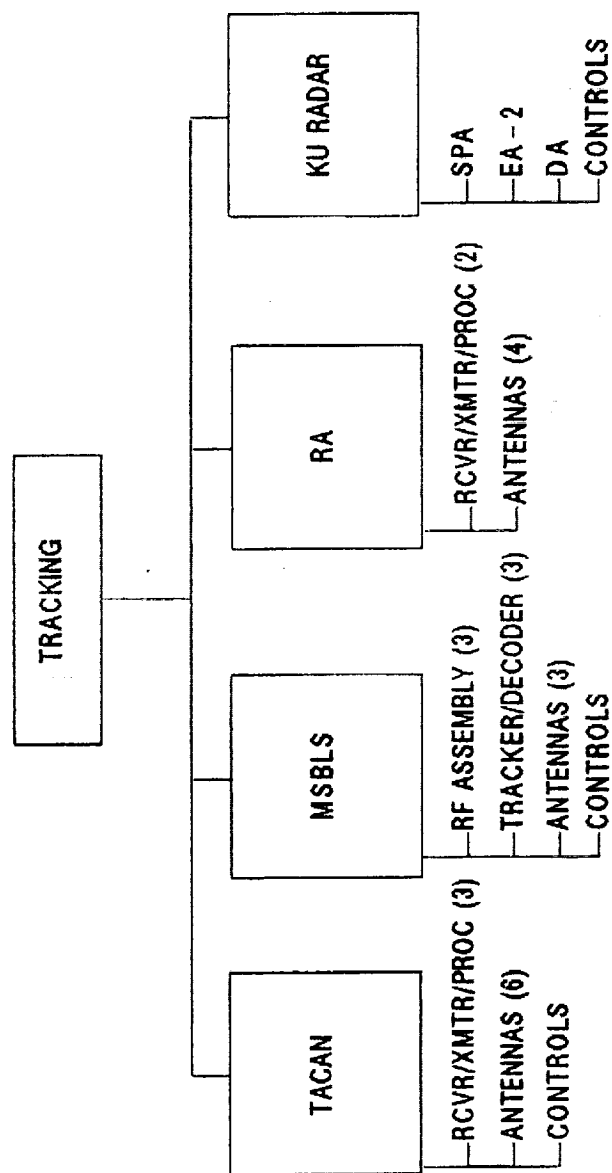


Figure 3.4 - TRACKING SYSTEM HIERARCHY

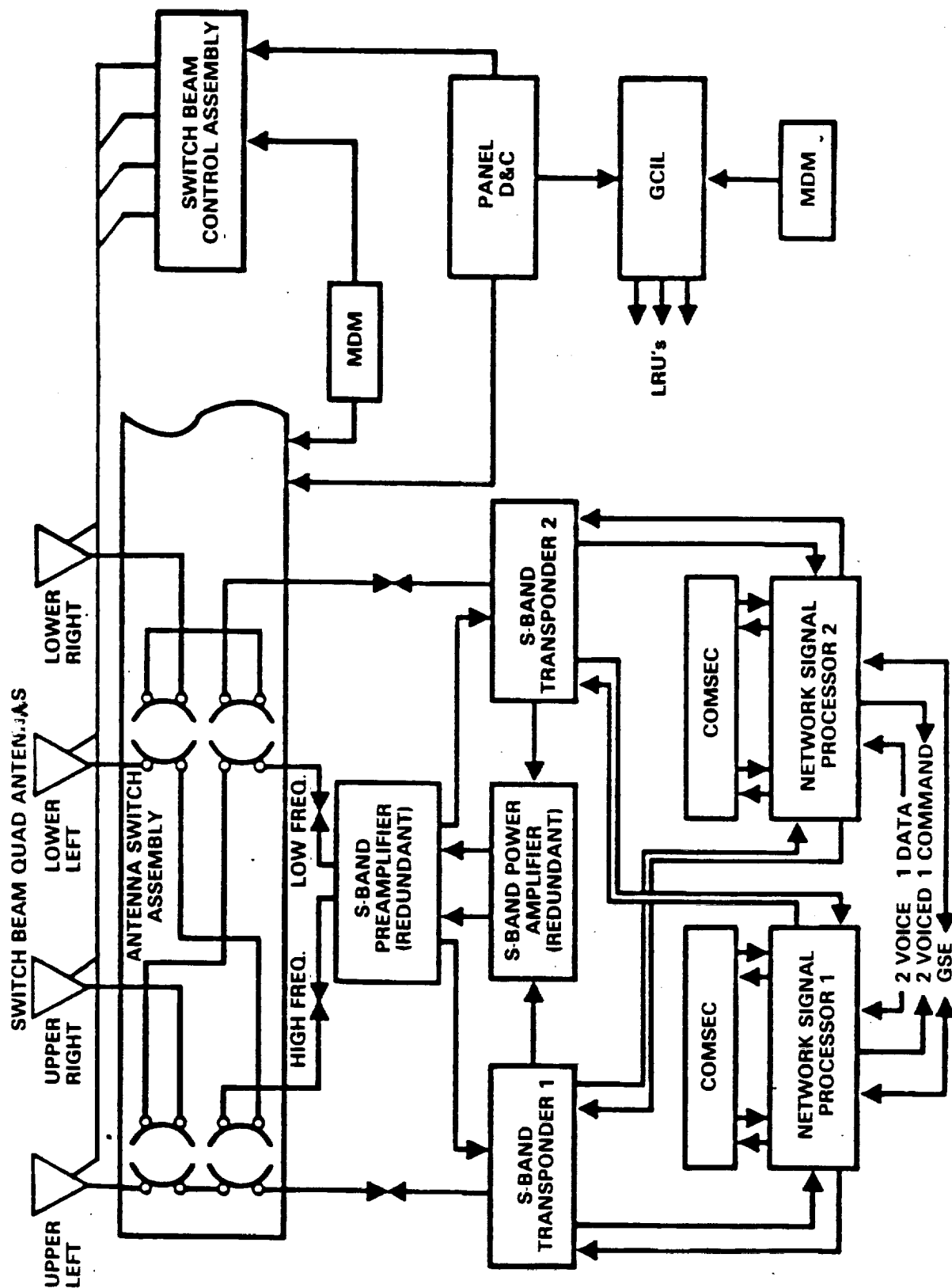


Figure 3.5 - S-BAND PM COMMUNICATIONS

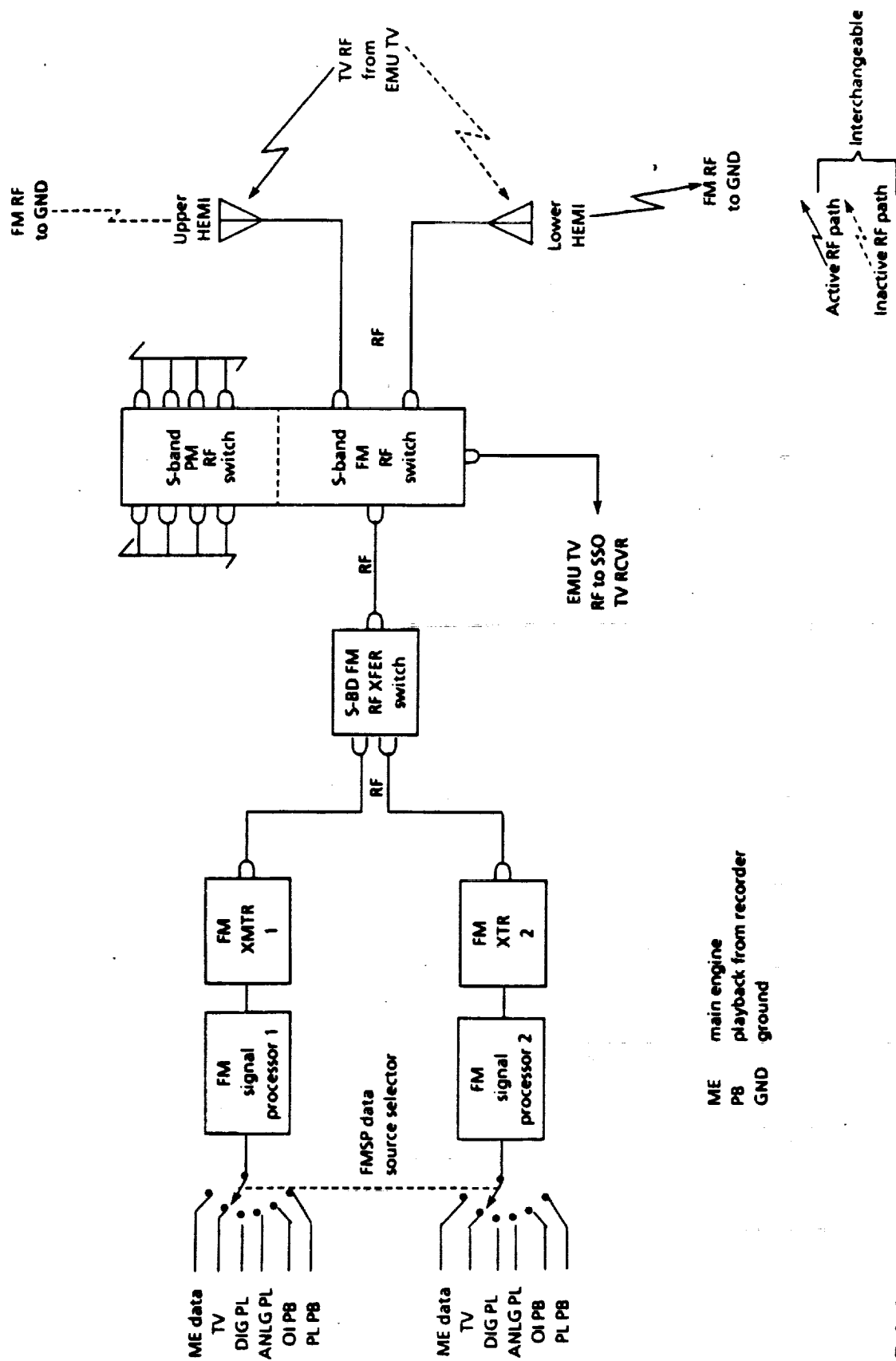


Figure 3.6 - S-BAND FM SYSTEM BLOCK DIAGRAM



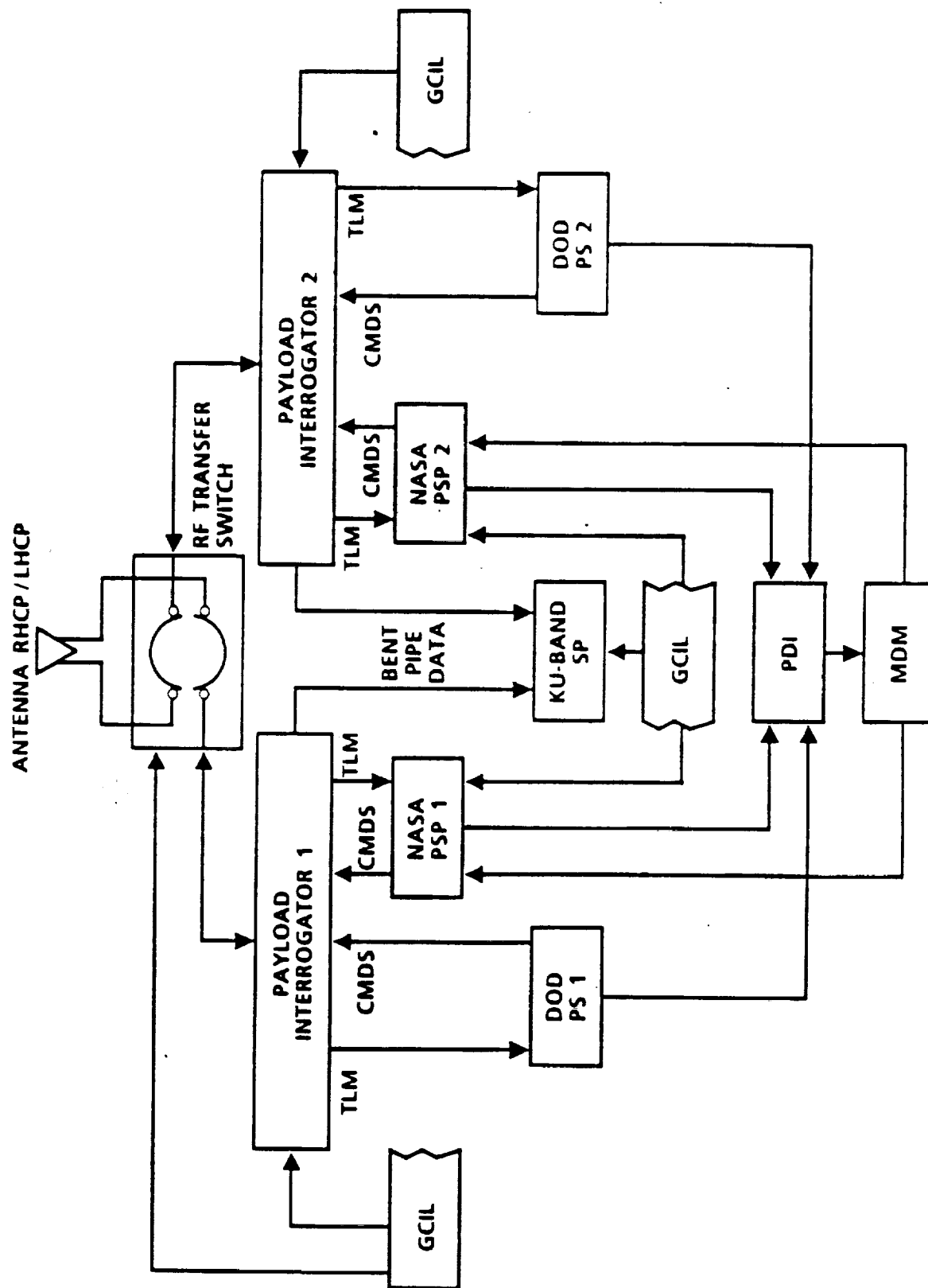


Figure 3.7 - S-BAND PAYLOAD COMMUNICATIONS



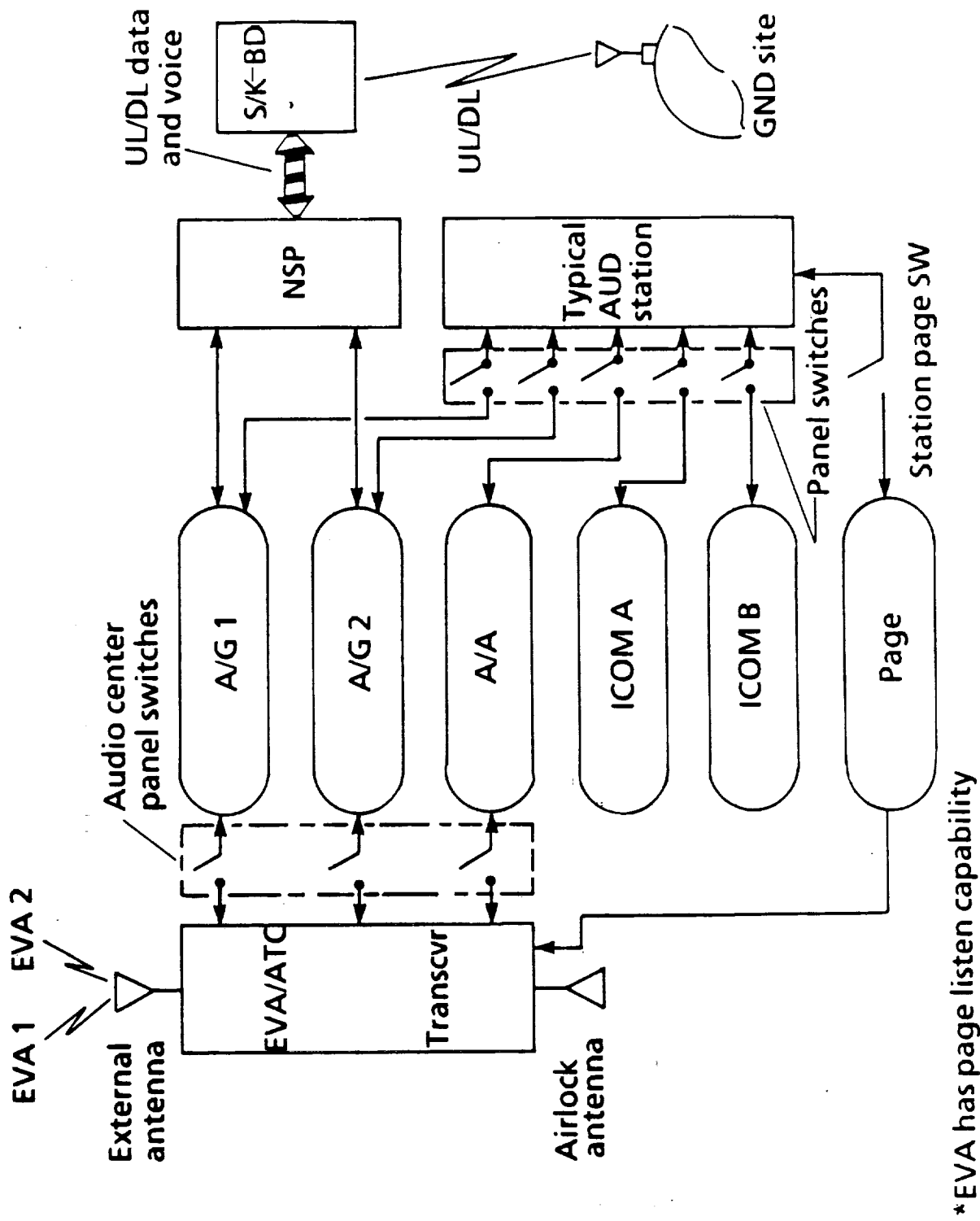
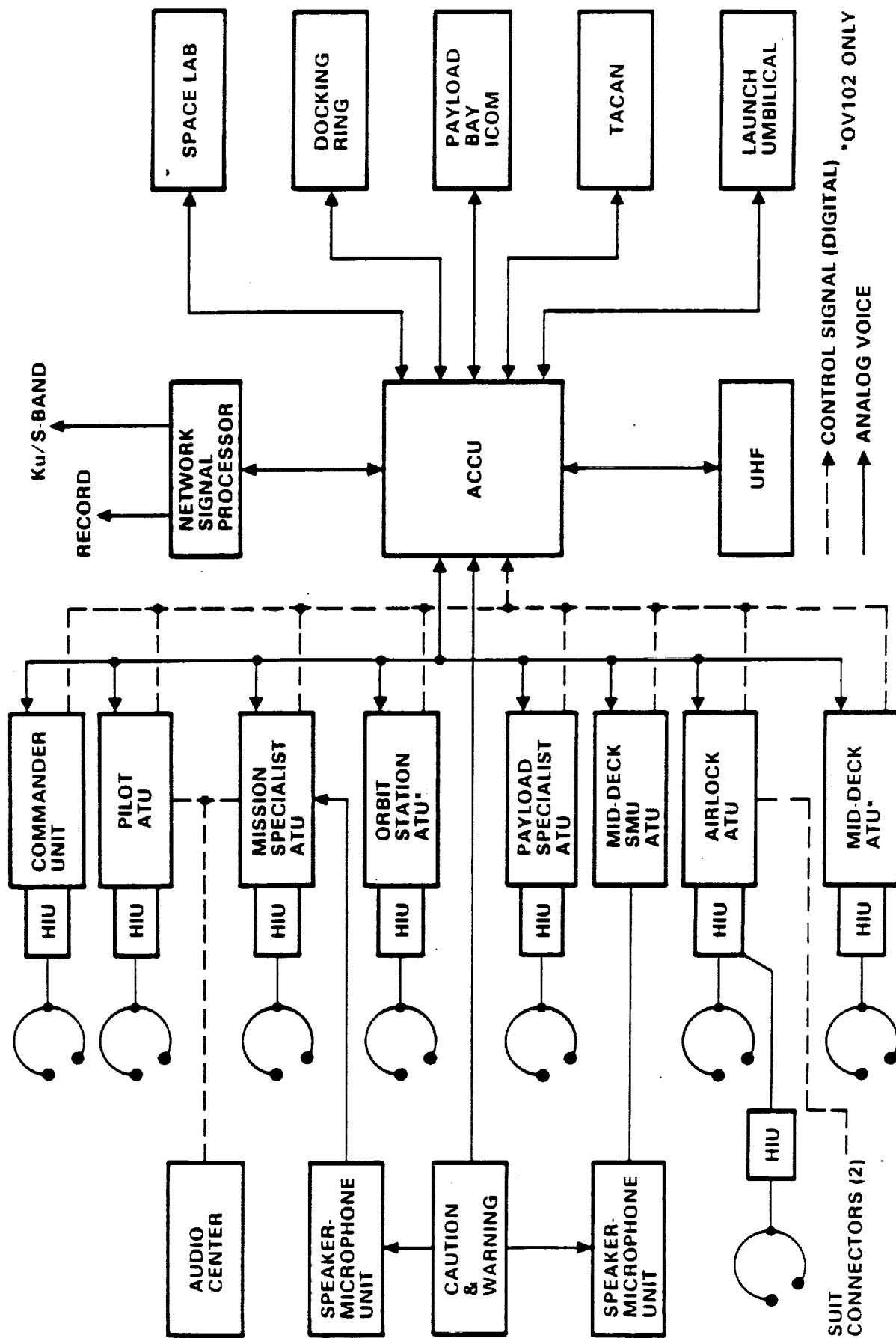


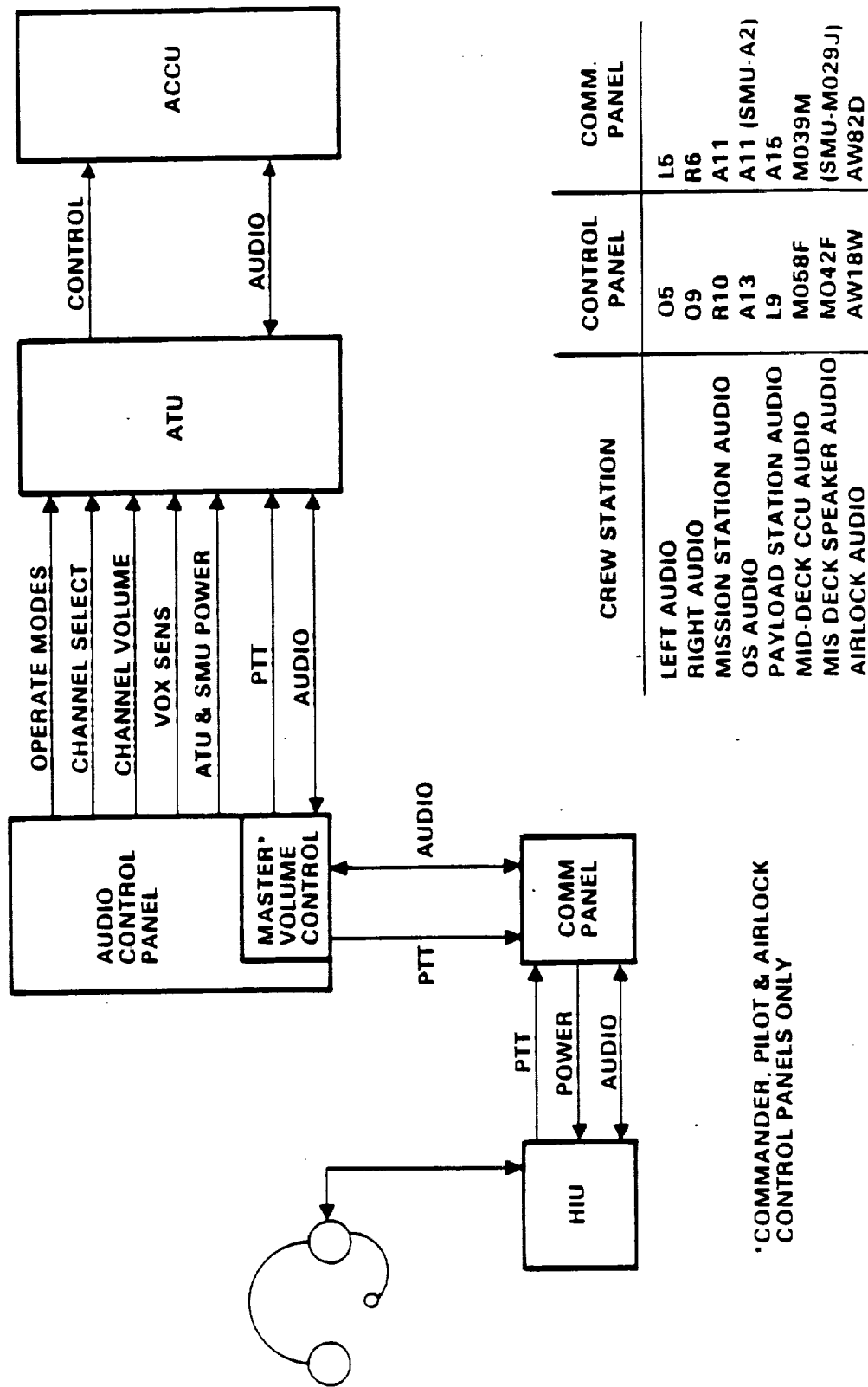
Figure 3.9 - UHF/AUDIO INTERFACE BLOCK DIAGRAM

\*EVA has page listen capability



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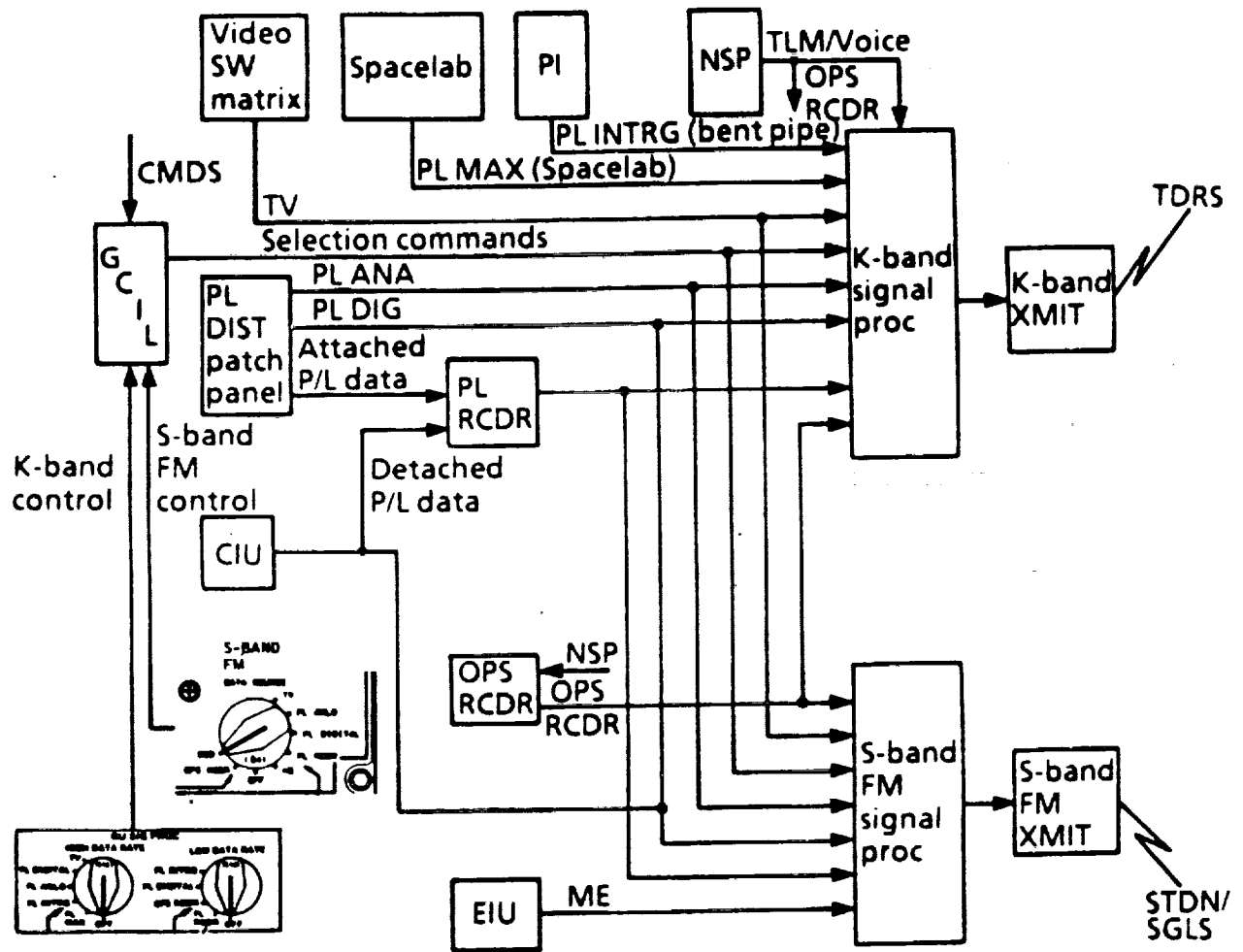
Figure 3.10 - AUDIO DISTRIBUTION SYSTEM BLOCK DIAGRAM



\*COMMANDER, PILOT & AIRLOCK  
CONTROL PANELS ONLY

Figure 3.11 - TYPICAL CREW STATION AUDIO BLOCK DIAGRAM

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Figure 3.12 - SELECTED DATA SOURCES FUNCTIONAL BLOCK DIAGRAM

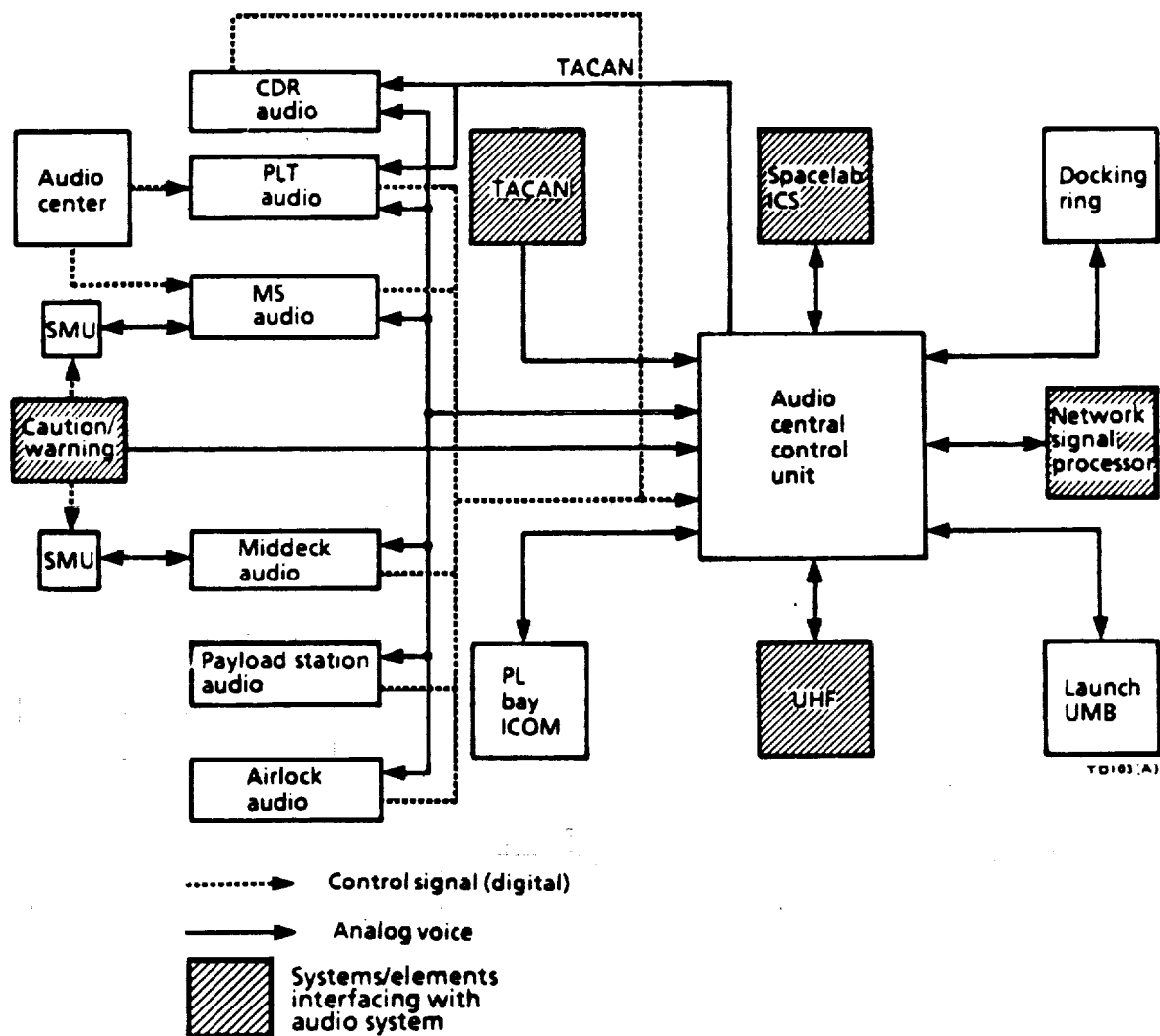


Figure 3.13 - AUDIO LOOPS AND SYSTEM INTERFACE

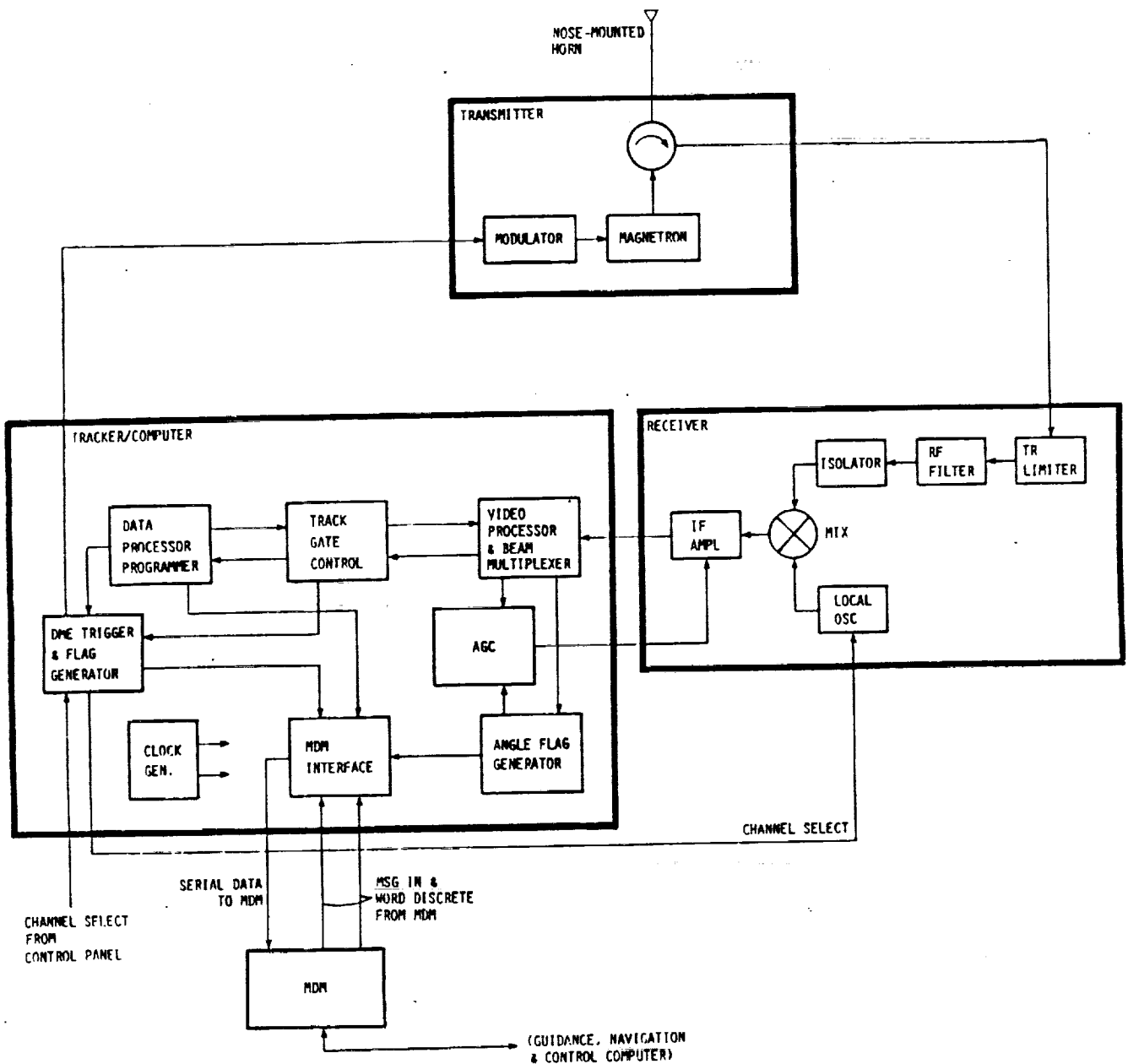


Figure 3.14 - MSBLS FUNCTIONAL BLOCK DIAGRAM



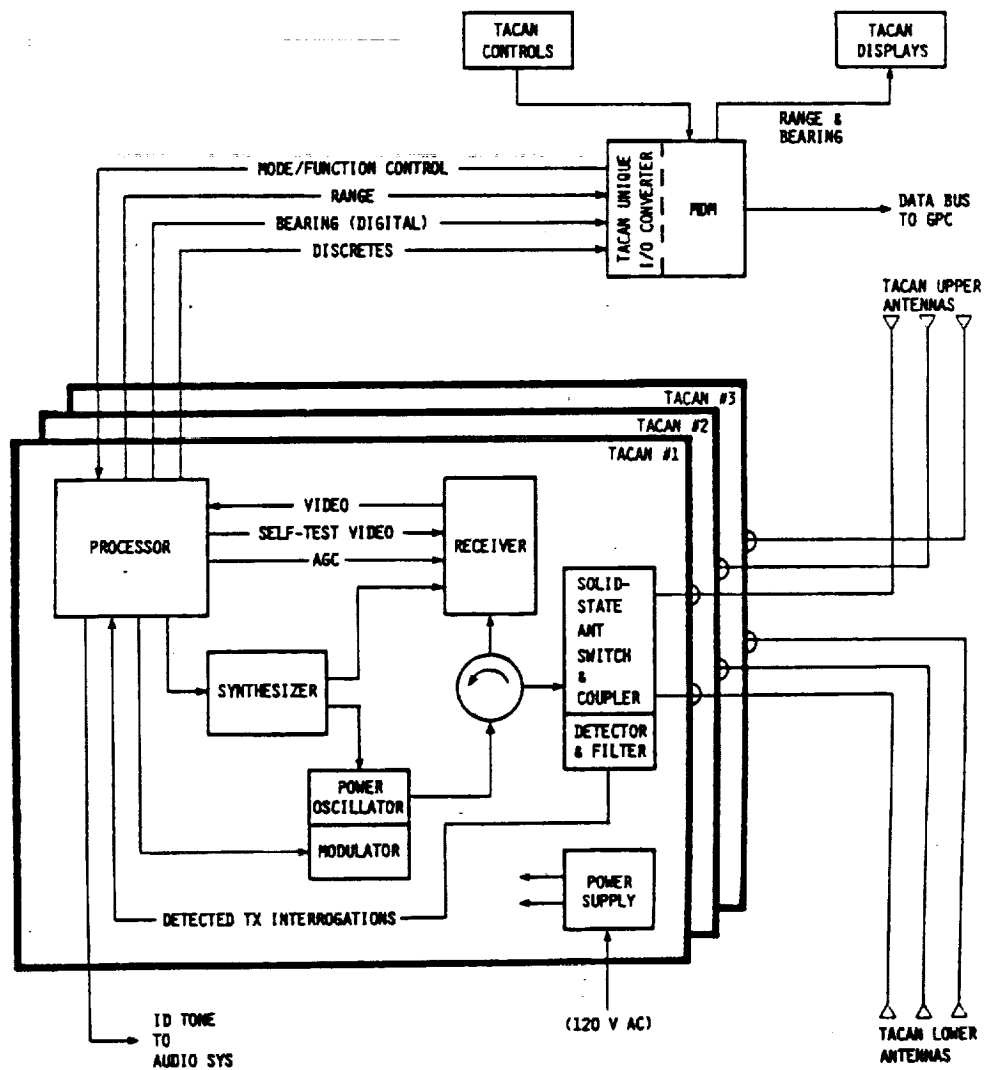


Figure 3.15 - TACAN FUNCTIONAL BLOCK DIAGRAM

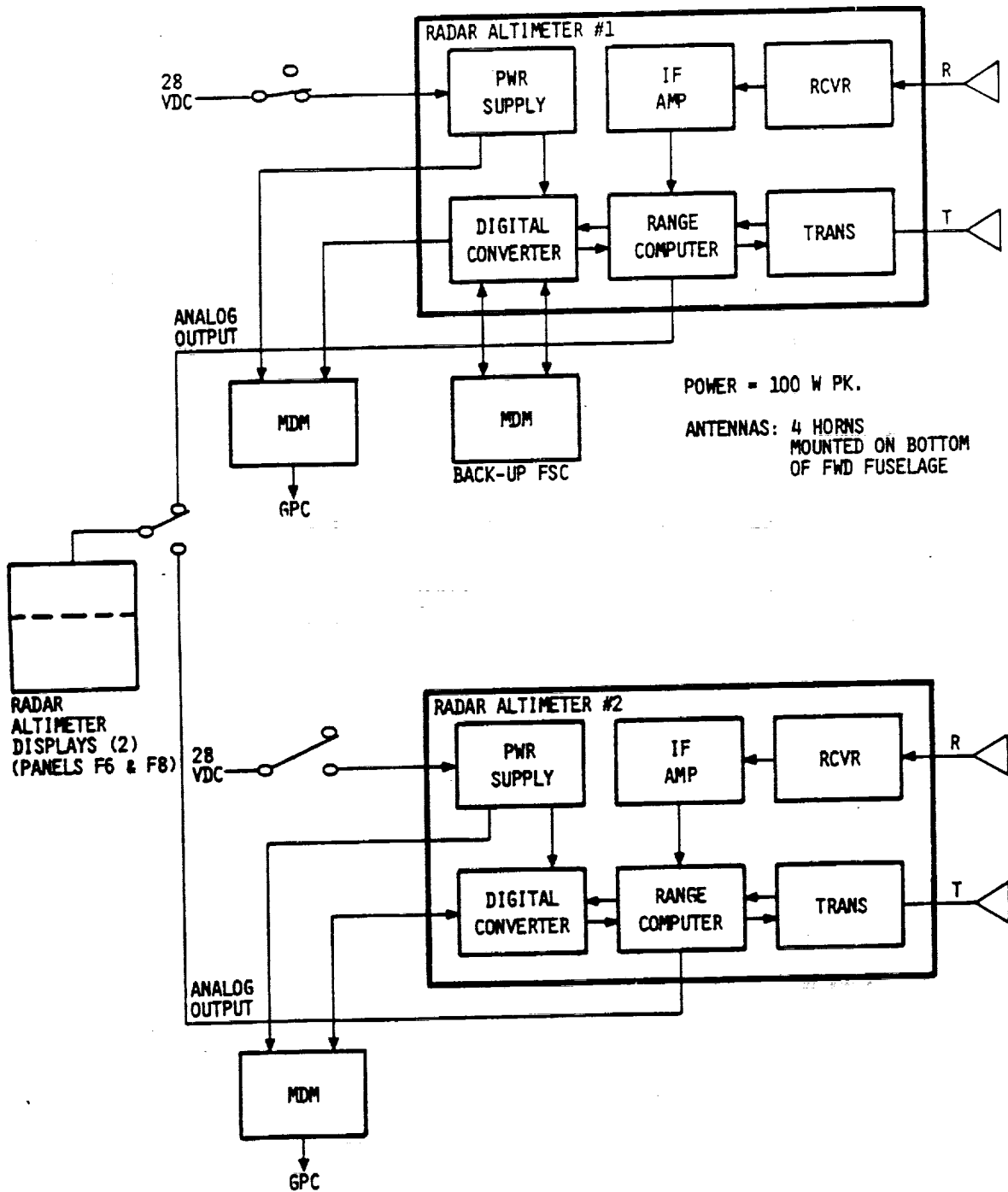


Figure 3.16 - RADAR ALTIMETER FUNCTIONAL BLOCK DIAGRAM

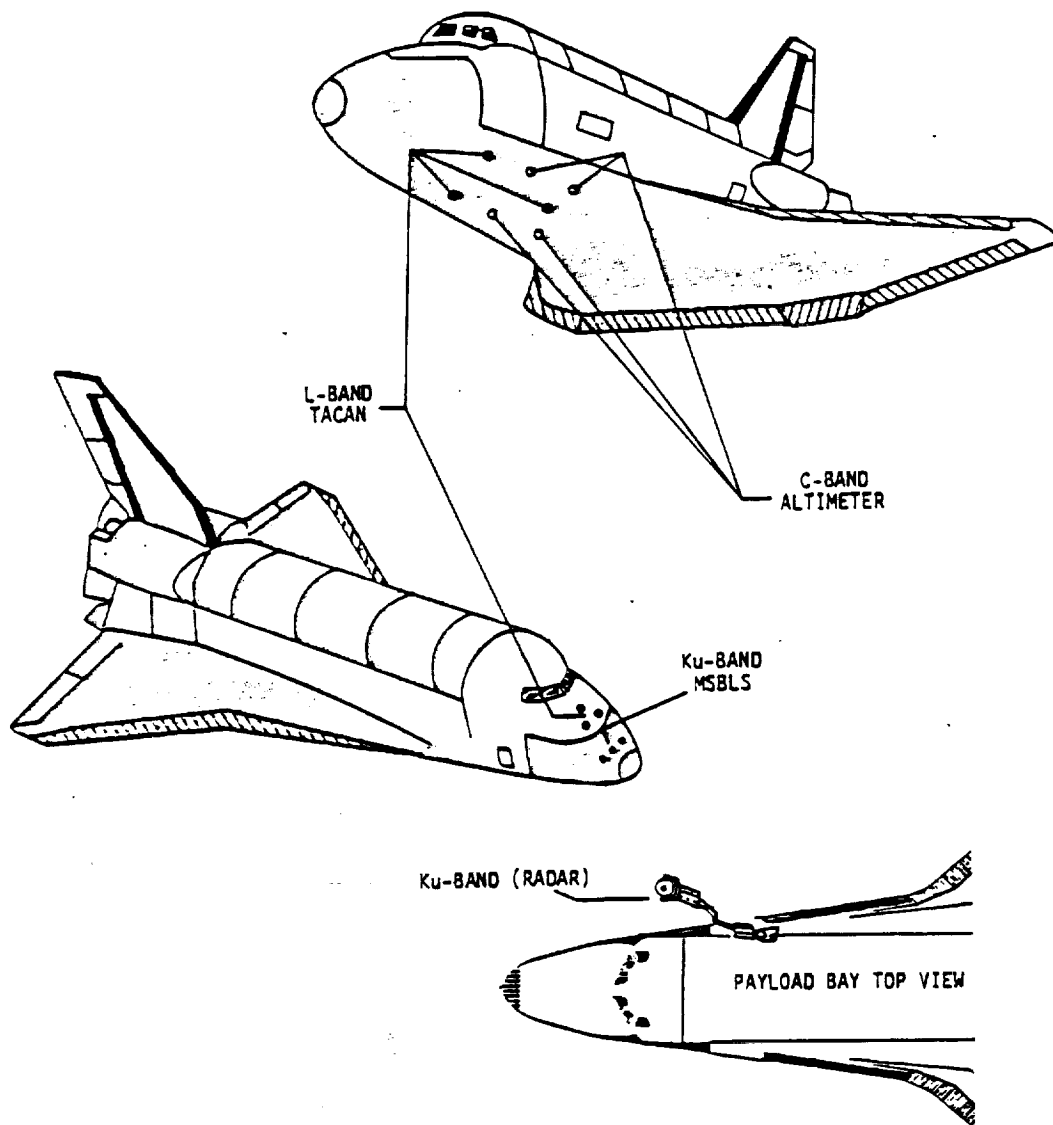


Figure 3.17 - NAVIGATIONAL ANTENNA LOCATIONS

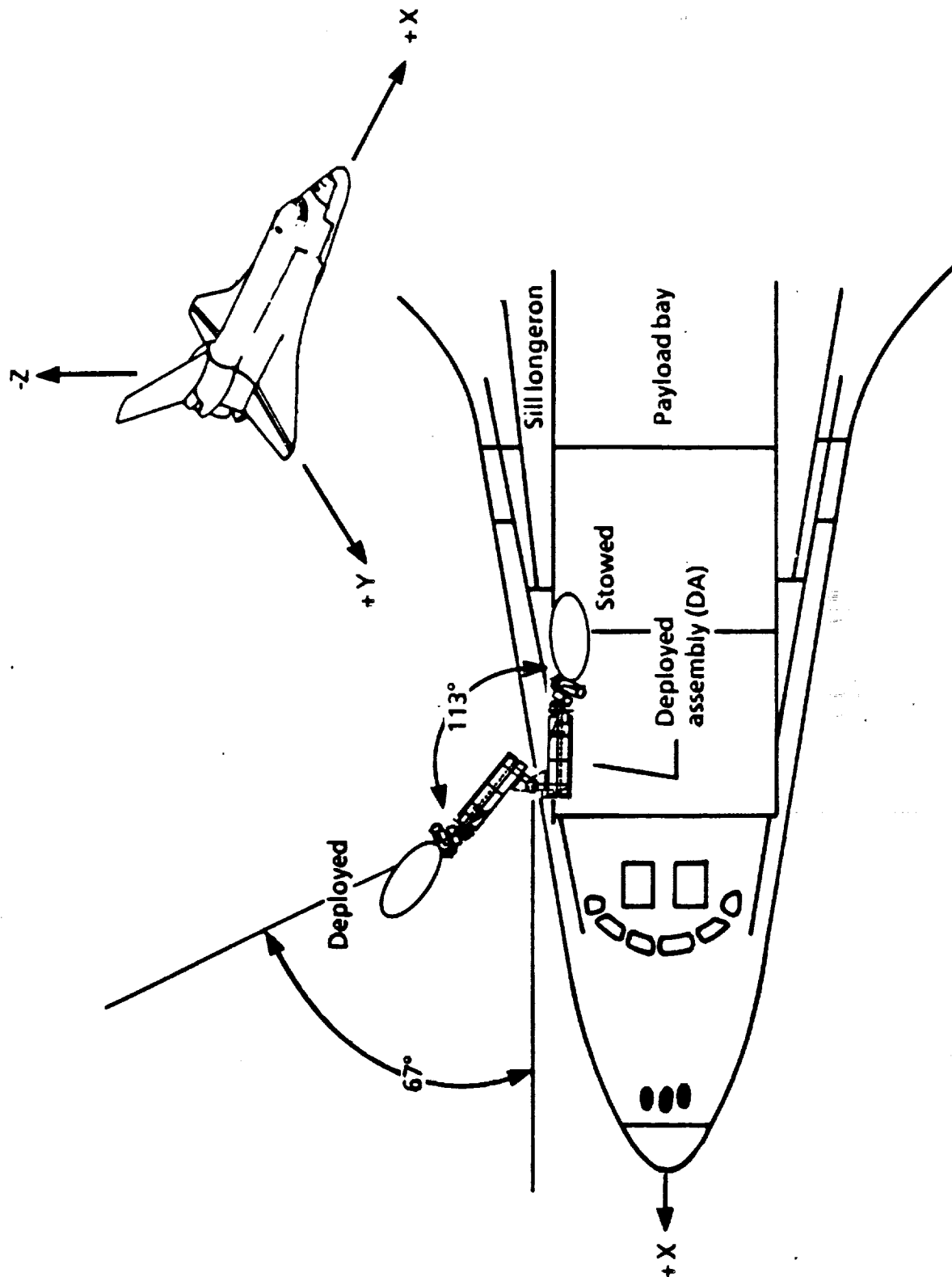


Figure 3.18 - DEPLOYED KU-BAND ANTENNA ASSEMBLY LOCATION

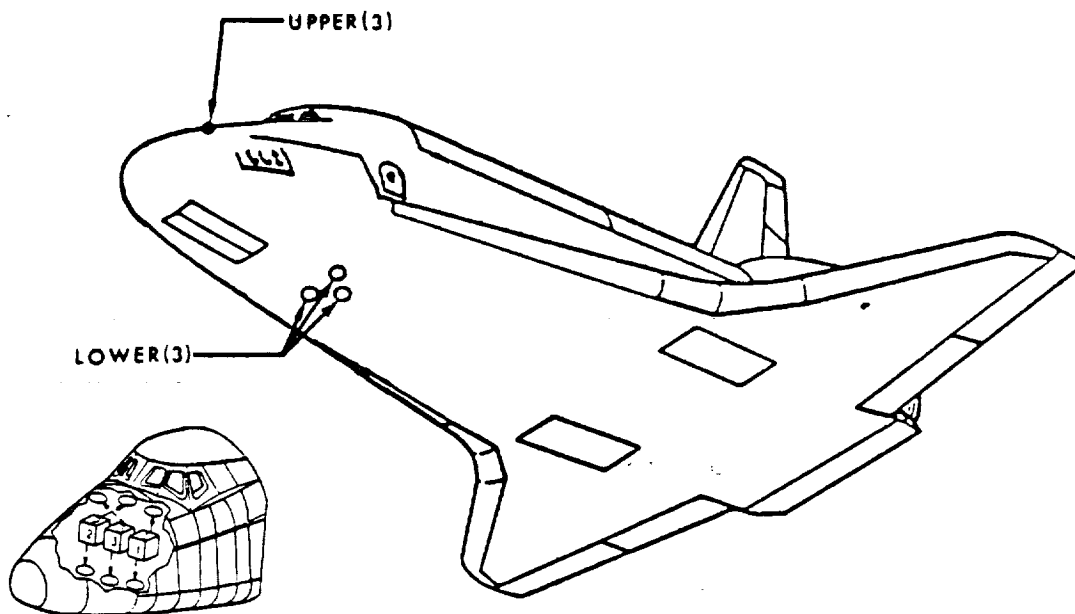


Figure 3.19 - TACAN ANTENNA LOCATION

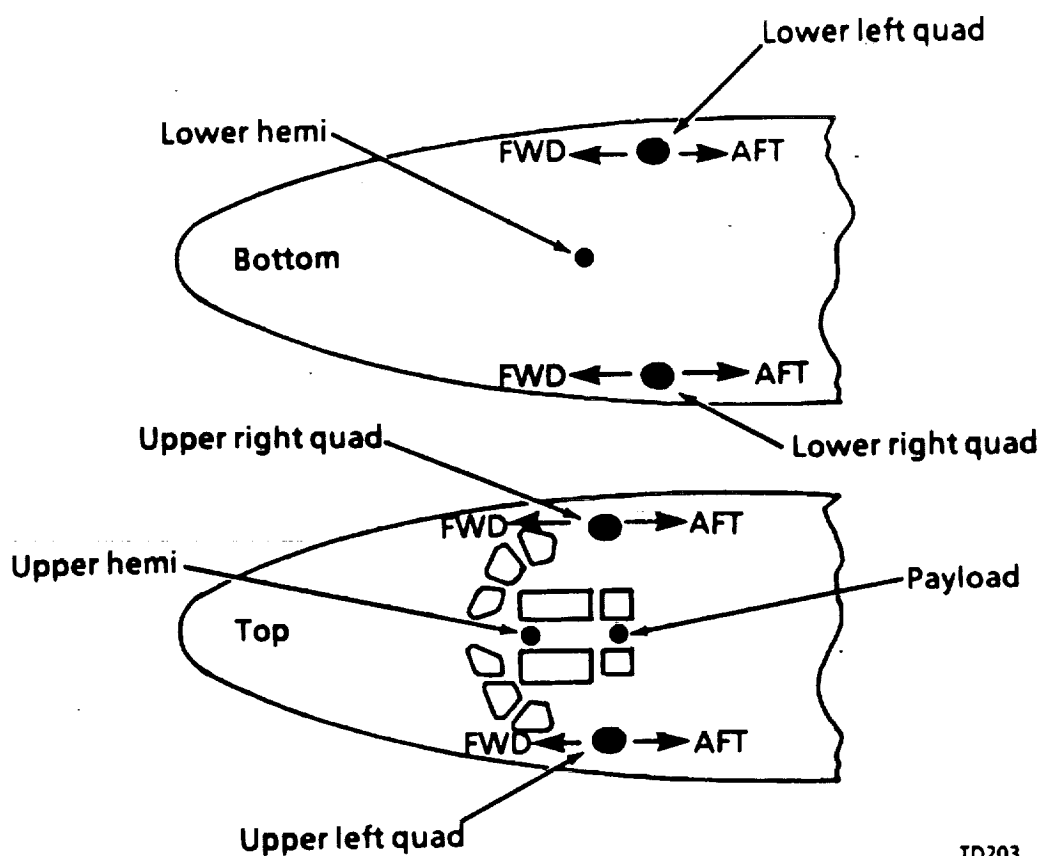
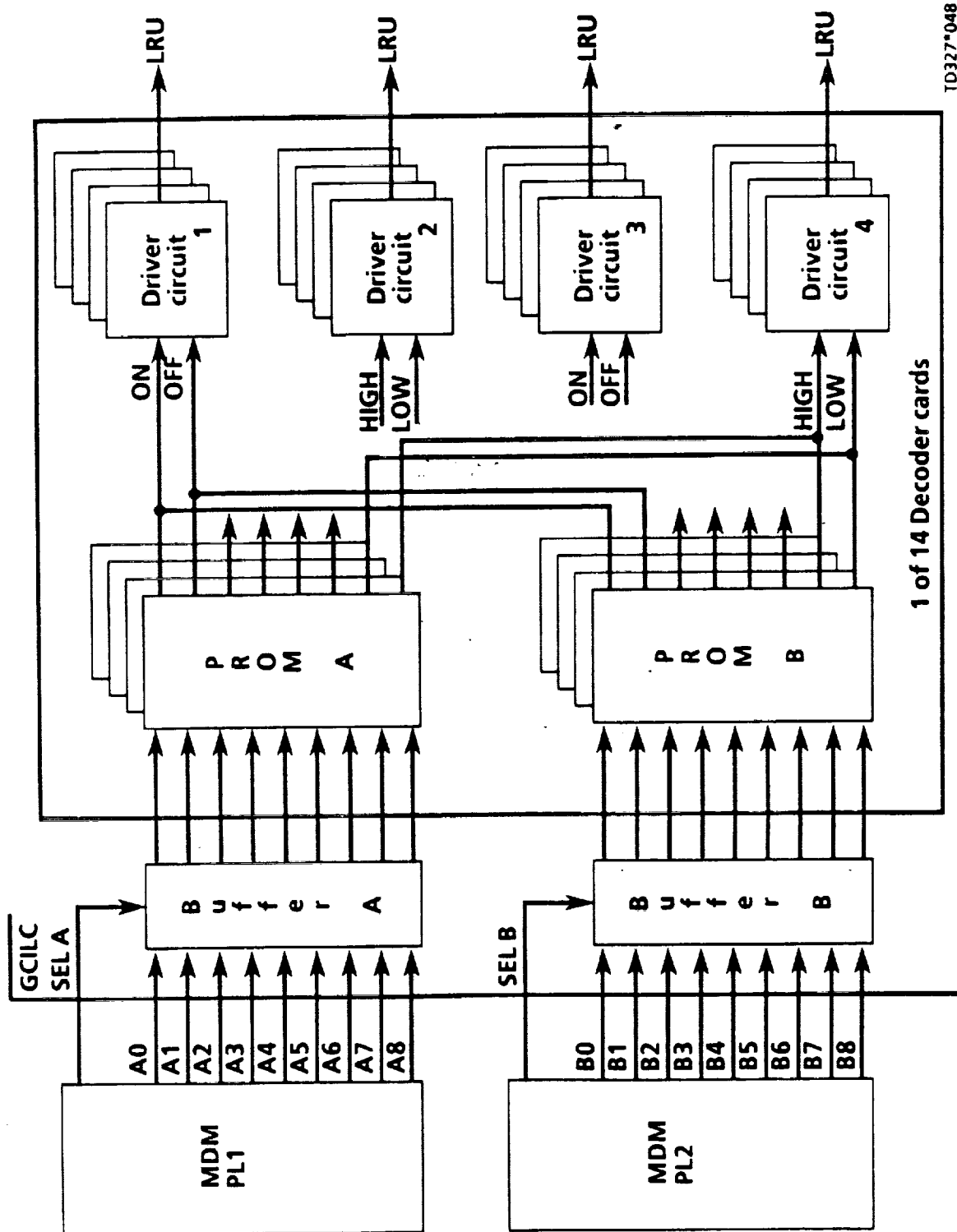


Figure 3.20 - S-BAND ANTENNA LOCATIONS

TD203



TD327\*048

Figure 3.21 - GCIL BLOCK DIAGRAM

#### 4.0 ANALYSIS RESULTS

Detailed analysis results for each of the identified failure modes are presented in Appendix C. Table III presents a summary of the failure criticalities for each of the two major subdivisions of the Communication and Tracking subsystem. Further discussion of each of these subdivisions and the applicable failure modes is provided in subsequent paragraphs.

TABLE III Summary of IOA Failure Modes and Criticalities							
Criticality:	1/1	2/1R	2/2	3/1R	3/2R	3/3	TOTAL
S-BAND PM		3	6	78	110	39	236
S-BAND FM				1		26	27
S-BAND PAYLOAD			10		48		58
KU COMM	4	2	4	33	26	20	89
UHF			4	8	1	4	17
AUDIO		4	5	28	3	36	76
NAVAIDS			21	30		6	57
CCTV		139		2	43	228	412
GCIL		1	1	5	3	2	12
EMU-TV	1					8	9
TAGS						15	15
GFE				4	5	22	31
TOTAL	5	149	51	189	239	406	1039

Of the 1,039 failure modes analyzed, 5 failures were determined to result in loss of crew or vehicle, and 264 were determined to result in loss of mission. A summary of the potential critical items is presented in Table IV. Appendix D presents a cross reference between each potential critical item (PCI) and a specific worksheet in Appendix C.

TABLE IV Summary of IOA Potential Critical Items						
Criticality:	1/1	2/1R	2/2	3/1R	3/2R	TOTAL
S-BAND PM	-	3	6	22	17	48
S-BAND FM	-	-	-	-	-	0
S-BAND PAYLOAD	-	-	10	-	14	24
KU COMM	4	2	4	-	8	18
UHF	-	-	4	2	1	7
AUDIO	-	4	5	-	-	9
NAVAIDS	-	-	21	-	-	21
CCTV	-	139	-	-	-	139
GCIL	-	1	1	-	-	2
EMU-TV	1	-	-	-	-	1
TAGS	-	-	-	-	-	-
GFE	-	-	-	-	-	-
TOTAL	5	149	51	24	40	269



#### 4.1 Analysis Results - S-band PM

The S-band PM analysis considered 236 failure modes, of which 48 modes were found to potentially cause loss of mission, or loss of redundancy to potentially cause loss of life or vehicle. These items are therefore placed on the Potential Critical Items list.

#### 4.2 Analysis Results - S-band FM

The S-band FM analysis considered 27 failure modes, of which only one was rated 3/1R. This item did not fail any screen; it was therefore not placed on the PCI list.

#### 4.3 Analysis Results - S-band Payload

The S-band Payload analysis considered 58 failure modes, of which 24 were found to potentially cause a loss of mission. These 24 items were placed on the PCI list.

#### 4.4 Analysis Results - Ku-band Comm

The Ku-band Comm analysis considered 89 failure modes, of which four were found to potentially cause a loss of life or vehicle and an additional 14 were found to potentially cause a loss of mission, when with a loss of redundancy to also cause a loss of life or vehicle. These 18 items were placed on the PCI list.

#### 4.5 Analysis Results - UHF

The UHF communication system analysis considered 17 failure modes, of which seven were found to potentially cause a loss of mission or loss of redundancy to cause a potential loss of life or vehicle. These seven items were placed on the PCI list.

#### 4.6 Analysis Results - Audio

The Audio system analysis considered 76 failure modes, of which nine were found to potentially cause a loss of mission, or loss of redundancy to cause a potential loss of life or vehicle. These nine items were placed on the PCI list.

#### 4.7 Analysis Results - Nav aids

The Nav aids analysis considered 57 failure modes, of which 21 were found to potentially cause a loss of mission. These 21 items were placed on the PCI list.

#### 4.8 Analysis Results - CCTV

The CCTV analysis considered 412 failure modes, of which 139 were found to potentially cause a loss of mission, or with a loss of redundancy to potentially cause a loss of life or vehicle. These 139 items were placed on the PCI list.

#### 4.9 Analysis Results - GCIL

The GCIL analysis considered ten failure modes, of which two were found to potentially cause a loss of mission, or with a loss of redundancy to potentially cause a loss of life or vehicle. These two items were placed on the PCI list.

#### 4.10 Analysis Results - EMU-TV

The EMU-TV analysis considered nine failure modes, of which one was found to potentially cause loss of life or vehicle. This item was placed on the PCI list.

#### 4.11 Analysis Results - TAGS

The TAGS analysis considered 15 failure modes, none of which were found to potentially cause loss of mission or loss of life or vehicle.

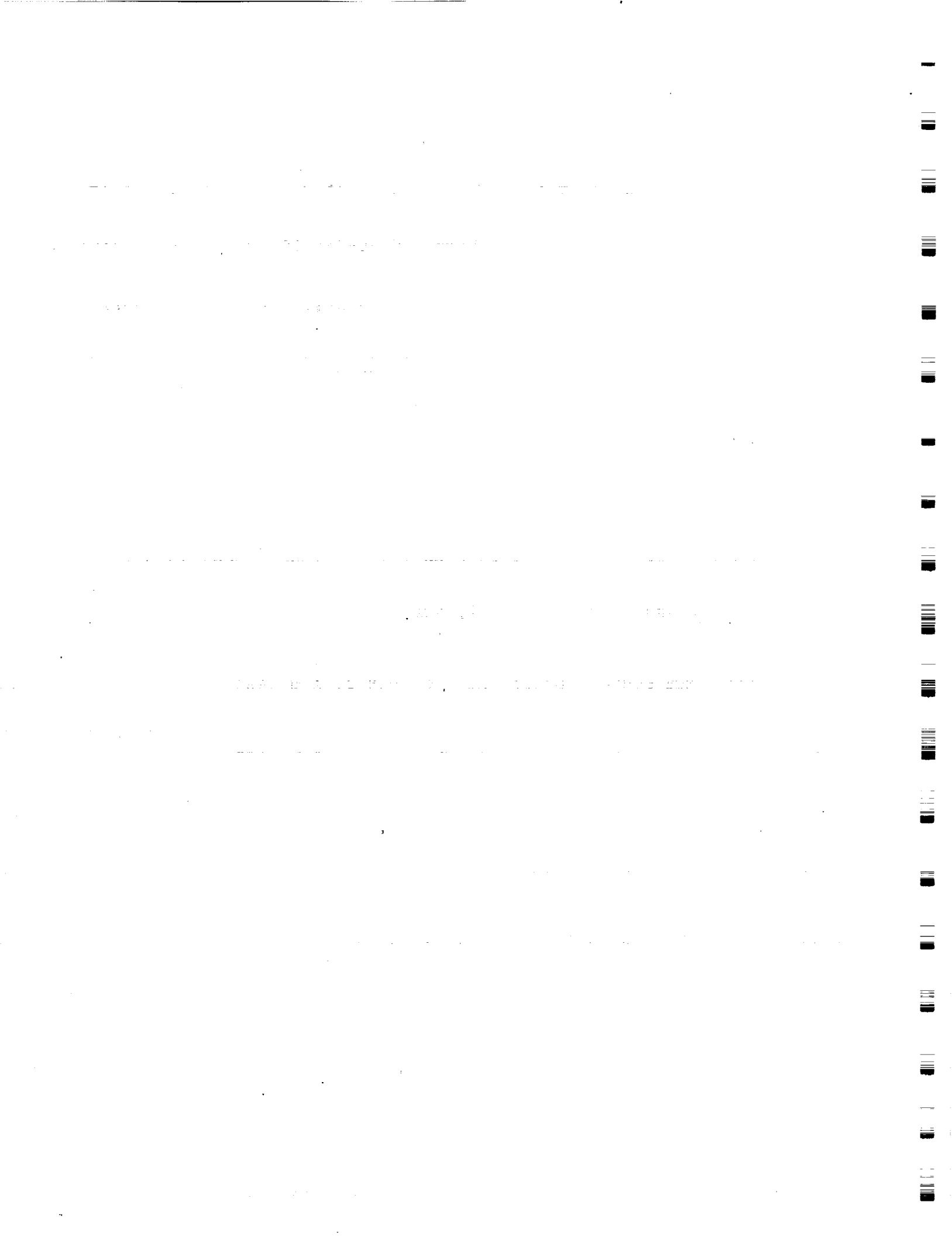
#### 4.12 Analysis Results - GFE

The GFE analysis considered 31 failure modes, none of which were found to potentially cause loss of mission or loss of life or vehicle.

## 5.0 REFERENCES

Reference documentation available from NASA and Rockwell was used in the analysis. The documentation used included the following:

1. RI Integrated Schematics: VS70-740249 (Audio), VS70-740300 (Comm & Tracking Block Diagram), VS70-740269 (FMSIC Processor), VS70-740279, (FM XMTR), VS70-740299 (GCIL), VS70-740109 (Ku-Band), VS70-740569 (MSBLS RCVR), VS70-740129 (NTWK S-Band XPDR), VS70-740400 (Power Block Diagram), VS70-740159 (Radar Altimeter), VS70-740259 (S-Band Antenna Switch), VS70-740229 (S-Band NTWK SIG Proc), VS70-740139 (S-Band PWR AMPL), VS70-740179 (TACAN), VS70-740189 (Television), VS70-740199 (Text and Graphics), VS70-740119 (UHF ATC/EVA XCVR)
2. Comm/Instrumentation Workbook, COM/IN 2102, Feb 1985
3. JSC-11174, Space Shuttle Systems Handbook, Rev. C, Sep 1985
4. Intro to Orbiter Comm/Instrumentation Systems, NAS9-18000, Oct 1986.
5. KU-Band Radar Workbook 2102, Nov 1985
6. KU-Band Comm Radar System SFOM, Vol. 4C, May 1985
7. INCO/Comm Systems Brief, Rev. C, PCN-3, Aug 1983
8. S-Band SFOM, Vol. 4B, Jan 1987
9. Payload Comm Workbook 2102, NAS9-18000, Feb 1987
10. Audio Systems UHF SFOM, Mar 1985
11. CCTV SFOM, Vol. 4D, Rev. A, PCN-2, Sep 1985
12. OMRSD NSTS 08171 File III
13. JSC-12820 FLT Rules Sect II
14. NSTS 22206, with Revisions 1, 2, 3, and 4.



# APPENDIX A ACRONYMS

A/A	- Air-to-Air
A/G 1	- Air-to-Ground 1
A/G 2	- Air-to-Ground 2
ACCU	- Audio Central Control Unit
ADS	- Audio Distribution System
AOS	- Acquisition of Signal
ATC	- Air Traffic Control
ATU	- Audio Terminal Unit
C&W	- Caution and Warning
cb	- Circuit Breaker
CCA	- Communications Carrier Assembly
CCTV	- Closed-Circuit Television
CCU	- Crew Communications Umbilical
CDR	- Commander
CIU	- Communications Interface Unit
CMD	- Command
comm	- Communication
cont	- Controller
CPLT	- Complete
D&C	- Displays and Controls
DA	- Deployed Assembly
DAM	- Driver Amplifier Module
DEA	- Deployed Electronic Assembly
DMA	- Deployed Mechanical Assembly
DOD	- Department of Defense
EMU	- Extravehicular Mobility Unit
EVA	- Extravehicular Activity
FM	- Frequency Modulated (or Modulation)
FMD	- Frequency Division Multiplexer
GCIL	- Ground Command Interface Logic
GPC	- General Purpose Computer
GSE	- Ground Support Equipment
GSTDN	- Ground Spaceflight Tracking and Data Netowrk
HIU	- Headset Interface Unit
ICMS	- Intercom Master Station
ICOM	- Intercommunications
ICOM A	- Intercom A
ICOM B	- Intercom B
ICRS	- Intercom Remote Station
ind	- Indicator
JSC	- Johnson Space Center

## ACRONYMS

LCC	- Launch Control Center
LEH	- Launch/Entry Helmet
LRU	- Line Replaceable Unit
lt	- Light
MADS	- Modular Auxiliary Data System
MCA	- Motor Control Assembly
MCC	- Mission Control Center (JSC)
MDM	- Multiplexer/Demultiplexer
ME	- Main Engine
MHz	- Megahertz
MMU	- Mass Memory Unit
MNA	- Main A
MS	- Mission Specialist
MSBLS	- Microwave Scanning Beam Landing System
NSP	- Network Signal Processor
OI	- Operational Instrumentation
OPS RCDR	- Operational Recorder
OTB	- Orbiter Timing Buffer
PCM	- Pulse Code Modulation
PCMMU	- Pulse Code Modulation Master Unit
PDI	- Payload Data Interleaver
PFS	- Percent Full Scale
PI	- Payload Interrogater
PL ANLG	- Payload Analog
PL DIGITAL	- Payload Digital
PL MAX	- Payload Maximum
PLT	- Pilot
PM	- Phase Modulation
PROM	- Programmable read-only memory
PS	- Payload Specialist
PSP	- Payload Signal Processor
PTT	- Push-to-talk
QPSK	- Quadrature Phase Shift Keying
RAM	- Random Access Memory
rf	- Radio Frequency
RFI	- Radio Frequency Interference
RMS	- Remote Manipulator System
rot	- Rotary Switch
RTS	- Remote Tracking Station
SA	- Single Access
SGLS	- Space Ground Link System
SGSC	- Strain Gage Signal Conditioner
SPA	- Signal Processor Assembly

## ACRONYMS

SRB	- Solid Rocket Booster
SSO	- Space Shuttle Orbiter
STDN	- Spaceflight Tracking and Data Network
SW	- Switch
TACAN	- Tactical Air Navigation
TAGS	- Text and Graphics
TDRS	- Tracking and Data Relay Satellite
TLM	- Telemetry
TV	- Television
tw	- Thumbwheel
UHF	- Ultra High Frequency
UL	- Uplink
VCO	- Voltage Controlled Oscillator
VOX	- Voice Operated Transmit
VSU	- Video Switching Unit
VTR	- Video Tape Recorder
WBSC	- Wide-Band Signal Conditioner
WCCU	- Wireless Crew Communications Umbilical
XMIT	- Transmit
XPNDR	- Transponder





## **APPENDIX B**

### **DEFINITIONS, GROUND RULES, AND ASSUMPTIONS**

- B.1 Definitions
- B.2 Project Level Ground Rules and Assumptions
- B.3 Subsystem-Specific Ground Rules and Assumptions

**APPENDIX B**  
**DEFINITIONS, GROUND RULES, AND ASSUMPTIONS**

**B.1 Definitions**

Definitions contained in NSTS 22206, Instructions For Preparation of FMEA/CIL, 10 October 1986, were used with the following amplifications and additions.

**INTACT ABORT DEFINITIONS:**

**RTLS** - begins at transition to OPS 6 and ends at transition to OPS 9, post-flight

**TAL** - begins at declaration of the abort and ends at transition to OPS 9, post-flight

**AOA** - begins at declaration of the abort and ends at transition to OPS 9, post-flight

**ATO** - begins at declaration of the abort and ends at transition to OPS 9, post-flight

**CREDIBLE (CAUSE)** - an event that can be predicted or expected in anticipated operational environmental conditions. Excludes an event where multiple failures must first occur to result in environmental extremes

**CONTINGENCY CREW PROCEDURES** - procedures that are utilized beyond the standard malfunction procedures, pocket checklists, and cue cards

**EARLY MISSION TERMINATION** - termination of onorbit phase prior to planned end of mission

**EFFECTS/RATIONALE** - description of the case which generated the highest criticality

**HIGHEST CRITICALITY** - the highest functional criticality determined in the phase-by-phase analysis

**MAJOR MODE (MM)** - major sub-mode of software operational sequence (OPS)

**MC** - Memory Configuration of Primary Avionics Software System (PASS)

**MISSION** - assigned performance of a specific Orbiter flight with payload/objective accomplishments including orbit phasing and altitude (excludes secondary payloads such as GAS cans, middeck P/L, etc.)

MULTIPLE ORDER FAILURE - describes the failure due to a single cause or event of all units which perform a necessary (critical) function

OFF-NOMINAL CREW PROCEDURES - procedures that are utilized beyond the standard malfunction procedures, pocket checklists, and cue cards

OPS - software operational sequence

PRIMARY MISSION OBJECTIVES - worst case primary mission objectives are equal to mission objectives

PHASE DEFINITIONS:

PRELAUNCH PHASE - begins at launch count-down Orbiter power-up and ends at moding to OPS Major Mode 102 (liftoff)

LIFTOFF MISSION PHASE - begins at SRB ignition (MM 102) and ends at transition out of OPS 1 (Synonymous with ASCENT)

ONORBIT PHASE - begins at transition to OPS 2 or OPS 8 and ends at transition out of OPS 2 or OPS 8

DEORBIT PHASE - begins at transition to OPS Major Mode 301 and ends at first main landing gear touchdown

LANDING/SAFING PHASE - begins at first main gear touchdown and ends with the completion of post-landing safing operations

APPENDIX B  
DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

B.2 IOA Project Level Ground Rules and Assumptions

The philosophy embodied in NSTS 22206, Instructions for Preparation of FMEA/CIL, 10 October 1986, was employed with the following amplifications and additions.

1. The operational flight software is an accurate implementation of the Flight System Software Requirements (FSSRs).

RATIONALE: Software verification is out-of-scope of this task.

2. After liftoff, any parameter which is monitored by system management (SM) or which drives any part of the Caution and Warning System (C&W) will support passage of Redundancy Screen B for its corresponding hardware item.

RATIONALE: Analysis of on-board parameter availability and/or the actual monitoring by the crew is beyond the scope of this task.

3. Any data employed with flight software is assumed to be functional for the specific vehicle and specific mission being flown.

RATIONALE: Mission data verification is out-of-scope of this task.

4. All hardware (including firmware) is manufactured and assembled to the design specifications/drawings.

RATIONALE: Acceptance and verification testing is designed to detect and identify problems before the item is approved for use.

5. All Flight Data File crew procedures will be assumed performed as written, and will not include human error in their performance.

RATIONALE: Failures caused by human operational error are out-of-scope of this task.

6. All hardware analyses will, as a minimum, be performed at the level of analysis existent within NASA/Prime Contractor Orbiter FMEA/CILs, and will be permitted to go to greater hardware detail levels but not lesser.

RATIONALE: Comparison of IOA analysis results with other analyses requires that both analyses be performed to a comparable level of detail.

7. Verification that a telemetry parameter is actually monitored during AOS by ground-based personnel is not required.

RATIONALE: Analysis of mission-dependent telemetry availability and/or the actual monitoring of applicable data by ground-based personnel is beyond the scope of this task.

8. The determination of criticalities per phase is based on the worst case effect of a failure for the phase being analyzed. The failure can occur in the phase being analyzed or in any previous phase, whichever produces the worst case effects for the phase of interest.

RATIONALE: Assigning phase criticalities ensures a thorough and complete analysis.

9. Analysis of wire harnesses, cables, and electrical connectors to determine if FMEAs are warranted will not be performed nor FMEAs assessed.

RATIONALE: Analysis was substantially complete prior to NSTS 22206 ground rule redirection.

10. Analysis of welds or brazed joints that cannot be inspected will not be performed nor FMEAs assessed.

RATIONALE: Analysis was substantially complete prior to NSTS 22206 ground rule redirection.

11. Emergency system or hardware will include burst discs and will exclude the EMU Secondary Oxygen Pack (SOP), pressure relief valves and the landing gear pyrotechnics.

RATIONALE: Clarify definition of emergency systems to ensure consistency throughout IOA project.

**APPENDIX B**  
**DEFINITIONS, GROUND RULES, AND ASSUMPTIONS**

**B.3 Communications and Tracking Subsystems-**  
**-Specific Ground Rules and Assumptions**

The IOA analysis was performed to the component or assembly level of the Communications and Tracking subsystem. The analysis considered the worst case effects of the hardware or functional failure on the subsystem, mission, and crew and vehicle safety.

1. Human error (e.g., system misconfiguration by crew or ground) will not be considered.

Rationale: Possible misconfigurations are out of scope for this analysis.

2. Inadvertent misconfigurations (e.g., accidental body contact by a crew member with a switch in zero-g operations) will not be considered.

Rationale: Most critical switches have guards, or are lever-lock type. Possible inadvertent misconfigurations are out of scope for this analysis.

3. Hardware items have been properly qualified, have passed applicable acceptance testing, and have been properly installed in the orbiter. Exception: if analysis of failure history of a part, subassembly, or LRU in the subsystem discloses multiple failures, that item will be flagged for special attention.

Rationale: Baseline assumption is that Program controls have resulted in hardware that is properly qualified and installed.

4. The criticality of a Communications and Tracking Subsystem hardware item will be assigned on the basis of the highest criticality function it performs.

Rationale: The Communications and Tracking Subsystem exists to process and route information for use by the crew and by ground controllers to facilitate the accomplishment of mission objectives and to ensure the safety of crew and vehicle. Worst-case effect from the loss of capability by a hardware item to perform a function determines its criticality.

5. Loss of all capability to update Orbiter State Vector can cause loss of crew/vehicle.

Rationale: GN&C hardware and Master Timing Unit drifts/errors can cause vehicle location errors in de-orbit and landing operations that could result in loss of crew/vehicle.

6. Interconnecting cables will not be evaluated.

Rationale: Baseline assumption is that the program controls require hardware that is properly installed, and cables are beyond the scope of this analysis.

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## APPENDIX C DETAILED ANALYSIS

This section contains the IOA analysis worksheets employed during the analysis of the DPS subsystem. The information on these worksheets is intentionally similar to the FMEA's written by Rockwell and the NASA. Each of these sheets identifies the item being analyzed, and parent assembly, as well as the function. For each failure mode, the possible causes are outlined, and the assessed hardware and functional criticality for each mission phase is listed, as described in the Rockwell Desk Instructions 100-2G. Finally, effects are entered at the bottom of each sheet, and the worst case criticality is entered at the top.

### LEGEND FOR IOA ANALYSIS WORKSHEETS

-----

#### Hardware Criticalities :

- 1 = Loss of life or vehicle
- 2 = Loss of mission
- 3 = Non loss of life or vehicle or mission

#### Functional Criticalities :

- 1R = Redundant identical hardware components or redundant functional paths all of which, if failed, could cause loss of life or vehicle.
- 2R = Redundant identical hardware components or redundant functional paths all of which, if failed, could cause loss of mission.

#### Redundancy Screen A :

- 1 = Is Checked Out PreFlight
- 2 = Is Capable of Check Out PreFlight
- 3 = Not Capable of Check Out PreFlight
- 4 = Do Not Know

#### Redundancy Screens B and C :

- P = Passed Screen
- F = Failed Screen
- NA = Not Applicable

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 4/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 1001 ABORT: 3/1R

ITEM: S-BAND QUAD ANTENNAS  
FAILURE MODE: LOSS OF OUTPUT, SHORT CIRCUIT, OPEN CIRCUIT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND QUAD ANTENNAS
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: FWD FUSELAGE  
PART NUMBER: MC481-0088-00XX

CAUSES: PIECE-PART FAILURE, MISHANDLING/ABUSE, LOSS OF INPUT,  
CONTAMINATION, VIBRATION

EFFECTS/RATIONALE:

THE FOUR QUAD ANTENNAS, USED ONE AT A TIME AND SELECTED EITHER UNDER GPC CONTROL OR MANUALLY FOR OPTIMUM TWO-WAY S-BAND PM RF LINK WITH TDRS OR GROUND STATIONS, CARRY OPERATIONAL UL/DL DATA. LOSS OF ALL UL/FL LINK RF PATHS FOR STATE VECTOR (SV) UPDATES AND ALL DL/RL PATHS FOR TELEMETRIC CONFIRMATION OF PROPER RECEIPT OF SV ABOARD SSO COULD CAUSE LOSS OF CREW/VEHICLE. UNLIKE REDUNDANCY FOR SV UPDATES EXISTS FOR ALL MISSION PHASES VIA UHF UL AND, FOR FULLY OPERATIONAL TDRS, DURING ON-ORBIT VIA KU-BAND (WHEN KU-BAND IS NOT BEING USED IN ITS RADAR MODE). SV UPDATES ARE TWO-STAGE LOADS REQUIRING AN EXECUTE FROM GROUND AFTER TLM CONFIRMATION THAT THE CORRECT SV DATA WAS LOADED ABOARD ORBITER; THUS TWO-WAY COMM IS REQUIRED FOR NORMAL SV LOADS.

REFERENCES: SYSTEM SCHEMATIC VS70-740259; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEFS 4, 10; OMRSD V74 FILE III

REPORT DATE 12/31/87 C-2

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 4/06/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 1002 ABORT: 3/1R

ITEM: S-BAND QUAD ANTENNAS  
FAILURE MODE: ERRATIC/INTERMITTENT OPERATION

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND QUAD ANTENNAS
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: FWD FUSELAGE  
PART NUMBER: MC481-0088-00XX

CAUSES: PIECE-PART FAILURE, VIBRATION, MISHANDLING/ABUSE

EFFECTS/RATIONALE:

THE FOUR QUAD ANTENNAS, USED ONE AT A TIME, CARRY OPERATIONAL UPLINK/DOWNLINK DATA VIA THE S-BAND PM RF LINK. LOSS OF ALL UPLINK/DOWNLINK RF PATHS FOR STATE VECTOR (SV) UPDATES AND TELEMETRIC CONFIRMATION OF PROPER RECEIPT OF SV LOAD ABOARD ORBITER COULD CAUSE LOSS OF CREW AND VEHICLE. UNLIKE REDUNDANCY FOR SV UPDATES EXISTS FOR ALL MISSION PHASES VIA UHF UPLINK AND DURING ON-ORBIT VIA KU-BAND (EXCEPT WHEN KU-BAND IS IN RADAR MODE). SV UPDATES ARE TWO-STAGE LOADS REQUIRING AN "EXECUTE" FROM GROUND, NORMALLY AFTER TELEMETRIC CONFIRMATION THAT THE CORRECT SV DATA WAS LOADED ABOARD ORBITER; THUS TWO-WAY COMM IS REQUIRED FOR NORMAL SV LOADS.

REFERENCES: SYSTEM SCHEMATIC VS70-740259; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEFS 4, 10; OMRSD V74 FILE III

REPORT DATE 12/31/87

C-3

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 4/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 1003 ABORT: 3/3

ITEM: S-BAND QUAD ANTENNAS  
FAILURE MODE: FAILURE TO SWITCH BEAM, PHYSICAL BINDING/JAMMING

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND QUAD ANTENNAS
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: FWD FUSELAGE  
PART NUMBER: MC481-0088-00XX

CAUSES: PIECE-PART FAILURE, CONTAMINATION, MISHANDLING/ABUSE,  
VIBRATION

EFFECTS/RATIONALE: THE FOUR QUAD ANTENNAS, USED ONE AT A TIME, CARRY THE S-BAND PM TWO-WAY RF LINKS, WHICH IN TURN CARRY UPLINK/DOWNLINK OPERATIONAL DATA. EACH QUAD ANTENNA IS A DUAL-BEAM UNIT WHOSE BEAM CAN BE DIRECTED EITHER FORWARD OR AFT BY RF SWITCHES MOUNTED IN THE ANTENNA CAVITY. LOSS OF BEAM SWITCHING CAPABILITY (BECAUSE OF RF SWITCH FAILURE, FOR EXAMPLE) COULD CAUSE VEHICLE ATTITUDE CONSTRAINTS FOR TWO-WAY COMM WITH GROUND, AND POSSIBLE LOSS OF MAJOR MISSION OBJECTIVES BECAUSE UNTIL THE TRACKING AND DATA RELAY SATELLITE SYSTEM (TDRSS) IS FULLY OPERATIONAL, TWO-WAY OPERATIONAL DATA FLOW IS DEPENDENT ON THE S-BAND PM COMM SYSTEM.

REFERENCES: SYSTEM SCHEMATIC VS70-740259; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEFS 4, 10; OMRSD V74 FILE III

REPORT DATE 12/31/87

C-4

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 4/14/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 1004 ABORT: 3/3

ITEM: S-BAND QUAD ANTENNAS  
FAILURE MODE: BEAM SWITCH FAILS MID-TRAVEL

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND QUAD ANTENNAS
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: FWD FUSELAGE  
PART NUMBER: MC481-0088-00XX

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

THE FOUR QUADS, USED ONE AT A TIME, CARRY S-BAND PM 2-WAY RF, WHICH CARRIES UL/DL OPNL DATA. EACH QUAD IS A DUAL-BEAM UNIT WHOSE BEAM CAN BE DIRECTED EITHER FWD OR AFT BY RF SWITCHES IN THE ANTENNA CAVITY. RF SWITCH FAILURE IN MID-TRAVEL WOULD CAUSE LOSS OF THE AFFECTED QUAD. QUAD LOSS WOULD IMPOSE VEHICLE ATTITUDE CONSTRAINTS FOR TWO-WAY COMM WITH GROUND, AND COULD CAUSE LOSS OF MISSION. WITH FULLY OPERATIONAL TDRSS THERE WILL NORMALLY BE NEAR FULL-TIME UNLIKE REDUNDANCY ON-ORBIT VIA KU-BAND COMM FOR S-BAND PM LINK, BUT WHEN KU-BAND IS IN RADAR MODE, AS FOR RENDEZVOUS OPS, OR IS UNAVAILABLE (PL VULNERABLE TO KU-BAND RF), QUAD FAILURES COULD IMPOSE UNACCEPTABLE CONSTRAINTS ON SSO AND COULD CAUSE LOSS OF MAJOR MISSION OBJECTIVES.

REFERENCES: SYSTEM SCHEMATIC VS70-740259; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEFS 4, 10; OMRSD V74 FILE III

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 4/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 1005 ABORT: 3/3

ITEM: SWITCH BEAM CONTROL ELECTRONICS

FAILURE MODE: ERRONEOUS OUTPUT

LEAD ANALYST: A.W. ADDIS

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND QUAD ANTENNA SWITCH BEAM CONTROL ELECTRONICS
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: FWD AVIONICS BAY 3A  
PART NUMBER: MC450-0064-0001

CAUSES: PIECE-PART FAILURE, VIBRATION, MISHANDLING/ABUSE,  
CONTAMINATION, ERRONEOUS INPUT

EFFECTS/RATIONALE:

THE ACTIVE SWITCH BEAM CONTROL ELECTRONICS (SBCE) UNIT CONTROLS SELECTION OF FORWARD OR AFT RF BEAM DIRECTIVITY FOR EACH OF THE FOUR DUAL-BEAM S-BAND QUAD ANTENNAS. THERE ARE TWO IDENTICAL UNITS. THEY ARE USED ONE AT A TIME, AND ARE SELECTED BY GROUND CONTROL INTERFACE LOGIC COMMANDS (COMMAND MODE) OR PANEL CONTROL SWITCH (PANEL MODE). WITH ERRONEOUS SBCE OUTPUT, ANTENNA RF PATTERN COVERAGE FOR A GIVEN ORBITER ATTITUDE COULD BE GREATLY REDUCED, PLACING ATTITUDE CONSTRAINTS ON ORBITER THAT COULD CAUSE LOSS OF MAJOR MISSION OBJECTIVES AND THUS COULD CAUSE MISSION LOSS.

REFERENCES: SYSTEM SCHEMATIC VS70-740259; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEFS 4, 10; OMRSD V74 FILE III

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 4/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 1006 ABORT: 3/3

ITEM: SWITCH BEAM CONTROL ELECTRONICS  
FAILURE MODE: LOSS OF OUTPUT, ELECTRICAL SHORT, ELECTRICAL OPEN

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND QUAD ANTENNA SWITCH BEAM CONTROL ELECTRONICS
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: FWD AVIONICS BAY 3A  
PART NUMBER: MC450-0064-001

CAUSES: PIECE-PART FAILURE, VIBRATION, MISHANDLING/ABUSE,  
CONTAMINATION, LOSS OF INPUT

EFFECTS/RATIONALE:

THE ACTIVE SWITCH BEAM CONTROL ELECTRONICS (SBCE) UNIT CONTROLS SELECTION OF FWD OR AFT BEAM DIRECTIVITY FOR EACH OF THE FOUR DUAL-BEAM QUADS. AN SBCE FAILURE COULD INVOLVE AN INDIVIDUAL CHANNEL (E.G., PULSER OR RELAY DRIVER FAILURE) CONTROLLING BEAM DIRECTION FOR ONE QUAD, OR COULD AFFECT ALL FOUR QUADS (E.G., A FAILURE IN SELECTOR LOGIC). AFTER FAILURE OF THE REDUNDANT SBCE, THE LOSS OF CAPABILITY TO CONTROL QUAD BEAM DIRECTIVITY COULD PLACE ATTITUDE CONSTRAINTS ON SSO THAT COULD CAUSE LOSS OF MAJOR MISSION OBJECTIVES.

REFERENCES: SYSTEM SCHEMATIC VS70-740259; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEFS 4, 10; OMRSD V74 FILE III

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 4/14/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 1007 ABORT: 3/3

ITEM: SWITCH BEAM CONTROL ELECTRONICS  
FAILURE MODE: ERRATIC/INTERMITTENT OPERATION

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND QUAD ANTENNA SWITCH BEAM CONTROL ELECTRONICS
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/2R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: FWD AVIONICS BAY 3A  
PART NUMBER: MC450-0064-0001

CAUSES: PIECE-PART FAILURE, VIBRATION, MISHANDLING/ABUSE

EFFECTS/RATIONALE:

THE ACTIVE SWITCH BEAM CONTROL ELECTRONICS (SBCE) UNIT CONTROLS SELECTION OF FWD OR AFT BEAM DIRECTIVITY FOR EACH OF THE FOUR DUAL-BEAM QUADS. AN SBCE FAILURE COULD INVOLVE AN INDIVIDUAL CHANNEL (E.G., PULSER OR RELAY DRIVER FAILURE) CONTROLLING BEAM DIRECTION FOR ONE QUAD, OR COULD AFFECT ALL FOUR QUADS (E.G., A FAILURE IN SELECTOR LOGIC). AFTER FAILURE OF THE REDUNDANT SBCE, THE LOSS OF CAPABILITY TO CONTROL QUAD BEAM DIRECTIVITY COULD PLACE ATTITUDE CONSTRAINTS ON SSO THAT COULD CAUSE LOSS OF MAJOR MISSION OBJECTIVES.

REFERENCES: SYSTEM SCHEMATIC VS70-740259; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEFS 4, 10; OMRSD V74 FILE III



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 4/15/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 1008 ABORT: 3/3

ITEM: ANTENNA SWITCH ASSEMBLY  
FAILURE MODE: FAILS TO OPEN/CLOSE, FAILS TO SWITCH

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND QUAD ANTENNA SWITCH ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC478-0106-4004

CAUSES: MISHANDLING/ABUSE, CONTAMINATION, PIECE-PART FAILURE,  
VIBRATION, LOSS OF INPUT

EFFECTS/RATIONALE:

THE QUAD SECTION OF S-BAND ANTENNA SWITCH LRU HAS FOUR RF SWITCHES TO SELECT QUADS. THERE ARE TWO IDENTICAL SETS OF ELECTRONIC CONTROLS, IN ONE ENCLOSURE, USED ONE AT A TIME. FOR A GIVEN COMBINATION OF S-BAND PM OPERATIONAL FREQUENCIES/MODES, SEGMENTS OF TWO OF THE FOUR SWITCHES INTERCONNECT ACTIVE RF LRU WITH OPTIMUM QUAD. IF EITHER SWITCH REQUIRED FAILS TO OPEN/CLOSE PROPERLY, RF SYSTEM IS MISCONFIGURED FOR CURRENT SSO ATTITUDE, AND TWO-WAY COMM VIA S-BAND PM IS DEGRADED OR INTERRUPTED. THE FAILURE COULD CAUSE LOSS OF MISSION. LOSS OF ALL CAPABILITY TO INTERCONNECT RF LRU'S WITH QUADS WOULD CAUSE MISSION LOSS.

REFERENCES: SYSTEM SCHEMATIC VS70-740259; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEFS 4, 10; OMRSD V74 FILE III

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 4/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 1009 ABORT: 3/3

ITEM: ANTENNA SWITCH ASSEMBLY  
FAILURE MODE: INTERMITTENT/ERRATIC OPERATION

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND QUAD ANTENNA SWITCH ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC478-0106-4004

CAUSES: PIECE-PART FAILURE, VIBRATION, MISHANDLING/ABUSE

EFFECTS/RATIONALE:

THE QUAD SECTION OF S-BAND ANTENNA SWITCH LRU HAS FOUR RF SWITCHES TO SELECT QUADS. THERE ARE TWO IDENTICAL SETS OF ELECTRONIC CONTROLS, IN ONE ENCLOSURE, USED ONE AT A TIME. FOR A GIVEN COMBINATION OF S-BAND PM OPERATIONAL FREQUENCIES/MODES, SEGMENTS OF TWO OF THE FOUR SWITCHES INTERCONNECT ACTIVE RF LRU WITH OPTIMUM QUAD. IF EITHER SWITCH REQUIRED FAILS TO OPEN/CLOSE PROPERLY, RF SYSTEM IS MISCONFIGURED FOR CURRENT SSO ATTITUDE, AND TWO-WAY COMM VIA S-BAND PM IS DEGRADED OR INTERRUPTED. THE FAILURE COULD CAUSE LOSS OF MISSION. LOSS OF ALL CAPABILITY TO INTERCONNECT RF LRU'S WITH QUADS WOULD CAUSE MISSION LOSS.

REFERENCES: SYSTEM SCHEMATIC VS70-740259; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEFS 4, 10; OMRSD V74 FILE III

REPORT DATE 12/31/87

C-10

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 4/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 1010 ABORT: 3/3

ITEM: ANTENNA SWITCH ASSEMBLY  
FAILURE MODE: RF SWITCH FAILS MID-TRAVEL, PHYSICAL  
BINDING/JAMMING

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND QUAD ANTENNA SWITCH ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC478-0106-4004

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART STRUCTURAL  
FAILURE

EFFECTS/RATIONALE:

THE QUAD SECTION OF S-BAND ANTENNA SWITCH LRU HAS FOUR RF SWITCHES TO SELECT QUADS. THERE ARE TWO IDENTICAL SETS OF ELECTRONIC CONTROLS, IN ONE ENCLOSURE, USED ONE AT A TIME. FOR A GIVEN COMBINATION OF S-BAND PM OPERATIONAL FREQUENCIES/MODES, SEGMENTS OF TWO OF THE FOUR SWITCHES INTERCONNECT ACTIVE RF LRU WITH OPTIMUM QUAD. IF EITHER SWITCH REQUIRED FAILS TO OPEN/CLOSE PROPERLY, RF SYSTEM IS MISCONFIGURED FOR CURRENT SSO ATTITUDE, AND TWO-WAY COMM VIA S-BAND PM IS DEGRADED OR INTERRUPTED. THE FAILURE COULD CAUSE LOSS OF MISSION. LOSS OF ALL CAPABILITY TO INTERCONNECT RF LRU'S WITH QUADS WOULD CAUSE MISSION LOSS.

REFERENCES: SYSTEM SCHEMATIC VS70-740259; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEFS 4, 10; OMRSD V74 FILE III

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 4/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 1011 ABORT: 3/3

ITEM: ANTENNA SWITCH ASSEMBLY  
FAILURE MODE: RF SWITCH SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND QUAD ANTENNA SWITCH ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC478-0106-4004

CAUSES: CONTAMINATION, PIECE-PART FAILURE

EFFECTS/RATIONALE:

THE FOUR RF SWITCHES IN THE QUAD SECTION INTERCONNECT QUADS WITH ACTIVE RF LRU'S. FOR ANY COMBINATION OF S-BAND PM OPNL FREQUENCIES/MODES, RF SEGMENTS OF TWO OF THE FOUR SWITCHES INTERCONNECT ACTIVE RF LRU WITH OPTIMUM QUAD. IF EITHER RF SWITCH REQUIRED AT A GIVEN TIME SUSTAINS AN RF SHORT ACROSS CONTACTS THAT SHOULD OPEN, THE TWO-WAY RF SIGNALS WOULD BE ROUTED VIA TWO QUADS SIMULTANEOUSLY, CAUSING SEVERE RF SIGNAL DEGRADATION FOR DESIRED TWO-WAY PATH, AND POSSIBLE MISSION LOSS. IF THE SHORT IS TO GROUND THE RF SIGNALS ARE LOST FOR THAT DESIRED PATH, AND THAT ALSO COULD CAUSE MISSION LOSS. LOSS OF ALL CAPABILITY TO SELECT QUADS WOULD CAUSE MISSION LOSS.

REFERENCES: SYSTEM SCHEMATIC VS70-740259; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEFS 4, 10; OMRSD V74 FILE III

REPORT DATE 12/31/87

C-12

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 4/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 1012 ABORT: 3/3

ITEM: ANTENNA SWITCH ASSEMBLY  
FAILURE MODE: RF SWITCH OPEN

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND QUAD ANTENNA SWITCH ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC478-0106-4004

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION,  
MISHANDLING/ABUSE

EFFECTS/RATIONALE:

THE QUAD CONTROL SECTION OF THE S-BAND ANTENNA SWITCH ASSEMBLY CONSISTS OF CONTROLS, LOGIC GATES, AND RF SWITCHES. THE FOUR RF SWITCHES INTERCONNECT QUAD ANTENNAS WITH ACTIVE RF LRUS. FOR ANY GIVEN COMBINATION OF S-BAND PM OPERATIONAL FREQUENCIES AND MODES, RF SEGMENTS OF TWO OF THE FOUR RF SWITCHES ARE USED TO INTERCONNECT THE ACTIVE RF LRU WITH THE OPTIMUM QUAD. IF EITHER RF SWITCH REQUIRED AT A GIVEN TIME SUSTAINS AN OPEN CIRCUIT ACROSS AN RF PATH BETWEEN CONTACTS THAT SHOULD BE BRIDGED, THE TWO-WAY RF SIGNALS WOULD BE INTERRUPTED FOR THAT RF SYSTEM PATH. LOSS OF CAPABILITY TO SELECT A SPECIFIC QUAD COULD CAUSE LOSS OF MISSION. LOSS OF ALL CAPABILITY TO SELECT QUADS WOULD CAUSE LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740259; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEFS 4, 10; OMRSD V74 FILE III

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 4/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 1013 ABORT: 3/3

ITEM: S-BAND PREAMPLIFIER  
FAILURE MODE: OPEN (ELECTRICAL), LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND PREAMP
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC478-0106-2001

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE

EFFECTS/RATIONALE:

THE TWO PREAMPS, USED ONE AT A TIME, PROVIDE SELECTABLE AMPLIFICATION OF NASA S-BAND PM UL/FL RF IN STDN MODE, AND ARE REQUIRED FOR TDRS MODE. LOSS OF BOTH WOULD REQUIRE RECONFIGURING TO STDN LO PWR MODE FOR OPNL S-BAND PM TWO-WAY COMM AND COULD REQUIRE LO DATA RATE MODE BECAUSE OF POSSIBLE RF LINK DEFICITS AT HI DATA RATE. FOR SOME MISSIONS KU-BAND MAY NOT BE AVAILABLE BECAUSE OF PAYLOAD VULNERABILITY TO KU-BAND RF. LOSS OF TDRS MODE AND HI DATA RATE COULD CAUSE LOSS OF PRIME MISSION OBJECTIVES BECAUSE OF CONFLICTING VEHICLE ATTITUDE CONSTRAINTS (EXPERIMENT VS COMM ATTITUDE REQUIREMENTS). NOTE: LOSS OF PREAMPS FOR UL/FL ALSO CAUSES LOSS OF PWR AMPS FOR DL/RL.

REFERENCES: SYSTEM SCHEMATIC VS70-740129, VS70-740259; SSSH 16.1, 16.2; INCO/COMM SYSTEMS BRIEF 5; OMRSD V74 FILE III

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 4/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 1014 ABORT: 3/3

ITEM: S-BAND PREAMPLIFIER  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND PREAMP
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC478-0106-2001

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE

EFFECTS/RATIONALE:

THE TWO PREAMPS, USED ONE AT A TIME, PROVIDE SELECTABLE AMPLIFICATION OF NASA S-BAND PM UL/FL RF IN STDN MODE, AND ARE REQUIRED FOR TDRS MODE. LOSS OF BOTH WOULD REQUIRE RECONFIGURING TO STDN LO PWR MODE FOR OPNL S-BAND PM TWO-WAY COMM AND COULD REQUIRE LO DATA RATE MODE BECAUSE OF POSSIBLE RF LINK DEFICITS AT HI DATA RATE. FOR SOME MISSIONS KU-BAND MAY NOT BE AVAILABLE BECAUSE OF PAYLOAD VULNERABILITY TO KU-BAND RF. LOSS OF TDRS MODE AND HI DATA RATE COULD CAUSE LOSS OF PRIME MISSION OBJECTIVES BECAUSE OF CONFLICTING VEHICLE ATTITUDE CONSTRAINTS (EXPERIMENT VS COMM ATTITUDE REQUIREMENTS). NOTE: LOSS OF PREAMPS FOR UL/FL ALSO CAUSES LOSS OF PWR AMPS FOR DL/RL.

REFERENCES: SYSTEM SCHEMATIC VS70-740129, VS70-740259; SSSH 16.1, 16.2; INCO/COMM SYSTEMS BRIEF 5; OMRSD V74 FILE III

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 4/22/87  
SUBSYSTEM: COMM & TRACK  
MDAC ID: 1015

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 3/3

ITEM: S-BAND PREAMPLIFIER  
FAILURE MODE: FAILS OUT OF TOLERANCE

LEAD ANALYST: A.W. ADDIS

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND PREAMP
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC478-0106-2001

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE,  
VIBRATION

EFFECTS/RATIONALE:

THE TWO PREAMPS, USED ONE AT A TIME, PROVIDE SELECTABLE AMPLIFICATION OF NASA S-BAND PM UL/FL RF IN STDN MODE AND ARE REQUIRED FOR TDRS MODE. THEY ARE COOLED BY COLDPLATE. TEMP EXTREME OR OTHER FAILURE COULD CAUSE DEGRADED OUTPUT OR DETUNING AND REQUIRE SELECTION OF REDUNDANT UNIT. LOSS OF REDUNDANCY WOULD REQUIRE USE OF LO PWR MODE FOR S-BAND PM TWO-WAY COMM (LOSS OF PREAMPS ALSO CAUSES LOSS OF PWR AMPS FOR DL/RL) AND COULD REQUIRE LO DATA RATE FOR TWO-WAY COMM. LOSS OF TDRS MODE AND HI DATA RATE COULD CAUSE LOSS OF PRIME MISSION OBJECTIVES BECAUSE OF CONFLICTING VEHICLE ATTITUDE CONSTRAINTS (EXPERIMENT VS COMM ATTITUDE REQUIREMENTS).

REFERENCES: SYSTEM SCHEMATIC VS70-740129, VS70-740259; SSSH 16.1, 16.2; INCO/COMM SYSTEMS BRIEF 5; OMRSD V74 FILE III

REPORT DATE 12/31/87

C-16



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 4/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 1016 ABORT: 3/3

ITEM: S-BAND POWER AMPLIFIER  
FAILURE MODE: OPEN (ELECTRICAL), LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND PREAMP
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC478-0106-2501

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

THE TWO PAS, USED ONE AT A TIME, PROVIDE SELECTABLE AMPLIFICATION OF NASA S-BAND PM DL/RL IN STDN MODE, AND ARE REQUIRED FOR TDRS MODE. LOSS OF BOTH WOULD REQUIRE RECONFIG TO STDN LO PWR MODE FOR S-BAND PM TWO-WAY COMM AND COULD REQUIRE LO DATA RATE MODE BECAUSE OF POSSIBLE RF LINK DEFICITS AT HI-DATA-RATE. FOR SOME MISSIONS KU-BAND MAY NOT BE AVAILABLE BECAUSE OF PAYLOAD VULNERABILITY TO KU-BAND RF. LOSS OF TDRS MODE AND HI DATA RATE COULD CAUSE LOSS OF PRIME MISSION OBJECTIVES BECAUSE OF CONFLICTING VEHICLE ATTITUDE CONSTRAINTS (EXPERIMENT VS COMM ATTITUDE REQUIREMENTS). NOTE: LOSS OF PAS FOR DL/RL ALSO CAUSES LOSS OF PREAMPS FOR UL/FL.

REFERENCES: SYSTEM SCHEMATIC VS70-740129, VS70-740139; SSSH 16.1, 16.2; INCO/COMM SYSTEMS BRIEF 9.0; OMRSD V74 FILE III

REPORT DATE 12/31/87

C-17

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 4/23/87  
SUBSYSTEM: COMM & TRACK  
MDAC ID: 1017

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 3/3

ITEM: S-BAND POWER AMPLIFIER  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND PREAMP
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC478-0106-2501

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

THE TWO PAS, USED ONE AT A TIME, PROVIDE SELECTABLE AMPLIFICATION OF NASA S-BAND PM DL/RL IN STDN MODE, AND ARE REQUIRED FOR TDRS MODE. LOSS OF BOTH WOULD REQUIRE RECONFIG TO STDN LO PWR MODE FOR S-BAND PM TWO-WAY COMM AND COULD REQUIRE LO DATA RATE MODE BECAUSE OF POSSIBLE RF LINK DEFICITS AT HI-DATA-RATE. FOR SOME MISSIONS KU-BAND MAY NOT BE AVAILABLE BECAUSE OF PAYLOAD VULNERABILITY TO KU-BAND RF. LOSS OF TDRS MODE AND HI DATA RATE COULD CAUSE LOSS OF PRIME MISSION OBJECTIVES BECAUSE OF CONFLICTING VEHICLE ATTITUDE CONSTRAINTS (EXPERIMENT VS COMM ATTITUDE REQUIREMENTS). NOTE: LOSS OF PAS FOR DL/RL ALSO CAUSES LOSS OF PREAMPS FOR UL/FL.

REFERENCES: SYSTEM SCHEMATIC VS70-740129, VS70-740139; SSSH 16.1, 16.2; INCO/COMM SYSTEMS BRIEF 9.0; OMRSD V74 FILE III

REPORT DATE 12/31/87

C-18

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 4/24/87  
SUBSYSTEM: COMM & TRACK  
MDAC ID: 1018

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 3/3

ITEM: S-BAND POWER AMPLIFIER  
FAILURE MODE: FAILS OUT OF TOLERANCE

LEAD ANALYST: A.W. ADDIS

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND PREAMP
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC478-0106-2501

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE,  
VIBRATION

EFFECTS/RATIONALE:

THE TWO PAS, USED ONE AT A TIME, PROVIDE SELECTABLE AMPLIFICATION OF NASA S-BAND PM DL/RL IN STDN MODE, AND ARE REQUIRED FOR TDRS MODE. THEY ARE COOLED BY COLDPLATE. TEMP EXTREME OR OTHER FAILURE COULD CAUSE DEGRADED OUTPUT OR DETUNING AND REQUIRE SELECTION OF REDUNDANT UNIT. LOSS OF REDUNDANCY WOULD REQUIRE USE OF LO PWR MODE FOR S-BAND PM TWO-WAY COMM (LOSS OF PAS ALSO CAUSES LOSS OF PREAMPS FOR UL/FL) AND COULD CAUSE LOSS OF PRIME MISSION OBJECTIVES BECAUSE OF CONFLICTING VEHICLE ATTITUDE CONSTRAINTS (EXPERIMENT VS COMM ATTITUDE REQUIREMENTS).

REFERENCES: SYSTEM SCHEMATIC VS70-740129, VS70-740139; SSSH 16.1, 16.2; INCO/COMM SYSTEMS BRIEF 9.0; OMRSD V74 FILE III

REPORT DATE 12/31/87

C-19

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 4/23/87  
SUBSYSTEM: COMM & TRACK  
MDAC ID: 1019

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 3/3

ITEM: PREAMP PANEL POWER SWITCH  
FAILURE MODE: FAILS MID-TRAVEL, PHYSICAL BINDING/JAMMING

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND PREAMP
- 5) PANEL POWER SWITCH
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7403

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS SWITCH PROVIDES POWER TO PREAMP 1 OR 2 WITH S-BAND PM SYSTEM IN GCIL PNL MODE. IT ALSO PROVIDES INTERLOCK CONTACTS FOR PWR TO S-BAND PAS IN PNL MODE. BINDING/JAMMING COULD PREVENT EITHER PREAMP AND ASSOCIATED PA FROM GETTING POWER IN PNL MODE. OPNL REDUNDANCY FOR POWERING THE LRUS EXISTS WITH SYSTEM IN GCIL CMD MODE, NORMAL OPNL MODE. PREAMP & PA ARE REQUIRED FOR STDN HI AND TDRS MODES. LOSS OF CONTROL OF PREAMPS/PAS AND UNAVAILABILITY OF KU-BAND WOULD REQUIRE OPS IN STDN LO AND COULD REQUIRE LO DATA RATE BECAUSE OF POSSIBLE RF LINK DEFICITS AT HI DATA RATE. THAT COULD CAUSE LOSS OF MISSION OBJECTIVES (VEHICLE ATTITUDE CONSTRAINTS AND/OR LOWER DATA RATE CAPABILITY) AND CONSEQUENTLY MISSION LOSS.

REFERENCES: SYSTEM SCHEMATIC VS70-740129, VS70-740139; SSSH 16.1, 16.2; INCO/COMM SYSTEMS BRIEF 9.0; OMRSD V74 FILE III

REPORT DATE 12/31/87

C-20

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 4/27/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 1020 ABORT: 3/3

ITEM: PREAMP PANEL POWER SWITCH  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, OPEN, FAILS TO SWITCH

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND PREAMP
- 5) PANEL POWER SWITCH
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7403

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS SWITCH PROVIDES POWER TO PREAMP 1 OR 2 WITH S-BAND PM SYSTEM IN GCIL PNL MODE. IT ALSO PROVIDES INTERLOCK CONTACTS FOR PWR TO S-BAND PAS IN PNL MODE. OPEN CIRCUIT COULD PREVENT EITHER PREAMP AND ASSOCIATED PA FROM GETTING POWER IN PNL MODE. OPNL REDUNDANCY FOR POWERING THE LRUS EXISTS WITH SYSTEM IN GCIL CMD MODE, NORMAL OPNL MODE. PREAMP & PA ARE REQUIRED FOR STDN HI AND TDRS MODES. LOSS OF CONTROL OF PREAMPS/PAS AND UNAVAILABILITY OF KU-BAND WOULD REQUIRE OPS IN STDN LO AND COULD REQUIRE LO DATA RATE BECAUSE OF POSSIBLE RF LINK DEFICITS AT HI DATA RATE. THAT COULD CAUSE LOSS OF MISSION OBJECTIVES (VEHICLE ATTITUDE CONSTRAINTS AND/OR LOWER DATA RATE CAPABILITY) AND CONSEQUENTLY MISSION LOSS.

REFERENCES: SYSTEM SCHEMATIC VS70-740129, VS70-740139; SSSH 16.1, 16.2; INCO/COMM SYSTEMS BRIEF 9.0; OMRSD V74 FILE III

REPORT DATE 12/31/87

C-21

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 4/27/87  
SUBSYSTEM: COMM & TRACK  
MDAC ID: 1021

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 3/3

ITEM: PREAMP PANEL POWER SWITCH  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND PREAMP
- 5) PANEL POWER SWITCH
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7403

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS SWITCH PROVIDES POWER TO PREAMP 1 OR 2 WITH S-BAND PM SYSTEM IN GCIL PNL MODE. IT ALSO PROVIDES INTERLOCK CONTACTS FOR PWR TO S-BAND PAS IN PNL MODE. ELECTRICAL SHORT COULD PREVENT EITHER PREAMP AND ASSOCIATED PA FROM GETTING POWER IN PNL MODE. OPNL REDUNDANCY FOR POWERING THE LRUS EXISTS WITH SYSTEM IN GCIL CMD MODE, NORMAL OPNL MODE. PREAMP & PA ARE REQUIRED FOR STDN HI AND TDRS MODES. LOSS OF CONTROL OF PREAMPS/PAS AND UNAVAILABILITY OF KU-BAND WOULD REQUIRE OPS IN STDN LO AND COULD REQUIRE LO DATA RATE BECAUSE OF POSSIBLE RF LINK DEFICITS AT HI DATA RATE. THAT COULD CAUSE LOSS OF MISSION OBJECTIVES (VEHICLE ATTITUDE CONSTRAINTS AND/OR LOWER DATA RATE CAPABILITY) AND CONSEQUENTLY MISSION LOSS.

REFERENCES: SYSTEM SCHEMATIC VS70-740129, VS70-740139; SSSH 16.1, 16.2; INCO/COMM SYSTEMS BRIEF 9.0; OMRSD V74 FILE III

REPORT DATE 12/31/87

C-22

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 4/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 1022 ABORT: 3/3

ITEM: PA OPERATE SWITCH  
FAILURE MODE: FAILS MID-TRAVEL, PHYSICAL BINDING/JAMMING

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND POWER AMPLIFIER
- 5) PA OPERATE SWITCH
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7403

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE PA PNL PWR ("OPERATE") SWITCH PROVIDES POWER TO PA1 OR PA2 FOR S-BAND PM SYSTEM GCIL PNL CONTROL MODE. BINDING/JAMMING OR FAIL IN MID-TRAVEL COULD PREVENT EITHER PA FROM GETTING POWER IN GCIL PNL MODE, AND PREVENT SWITCHING TO OTHER PA. PA (AND PREAMP) ARE REQUIRED FOR STDN HI AND TDRS MODES. OPERATIONAL REDUNDANCY EXISTS WITH THE SYSTEM IN GCIL CMD MODE. LOSS OF ALL CAPABILITY TO OPERATE IN HI PWR MODE WOULD FORCE SYSTEM OPERATION IN LO PWR MODE AND COULD REQUIRE ATTITUDE CONSTRAINTS THAT WOULD CAUSE LOSS OF MISSION OBJECTIVES AND THUS COULD CAUSE LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740129, VS70-740139; SSSH 16.1, 16.2; INCO/COMM SYSTEMS BRIEF 9.0; OMRSD V74 FILE III

REPORT DATE 12/31/87

C-23

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 4/29/87  
SUBSYSTEM: COMM & TRACK  
MDAC ID: 1023

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 3/3

ITEM: PA OPERATE SWITCH  
FAILURE MODE: ELECTRICAL OPEN

LEAD ANALYST: A.W. ADDIS

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND POWER AMPLIFIER
- 5) POWER AMPLIFIER OPERATE SWITCH
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7403

CAUSES: PIECE-PART FAILURE, VIBRATION, CONTAMINATION

EFFECTS/RATIONALE:

THE PA PNL PWR ("OPERATE") SWITCH PROVIDES POWER TO PA1 OR PA2 FOR S-BAND PM SYSTEM GCIL PNL CONTROL MODE. ELECTRICAL OPEN COULD PREVENT EITHER PA FROM GETTING POWER IN GCIL PNL MODE, AND PREVENT SWITCHING TO OTHER PA. PA (AND PREAMP) ARE REQUIRED FOR STDN HI AND TDRS MODES. OPERATIONAL REDUNDANCY EXISTS WITH THE SYSTEM IN GCIL CMD MODE. LOSS OF ALL CAPABILITY TO OPERATE IN HI PWR MODE WOULD FORCE SYSTEM OPERATION IN LO PWR MODE AND COULD REQUIRE ATTITUDE CONSTRAINTS THAT WOULD CAUSE LOSS OF MISSION OBJECTIVES AND THUS COULD CAUSE LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740129, VS70-740139; SSSH 16.1, 16.2; INCO/COMM SYSTEMS BRIEF 9.0; OMRSD V74 FILE III



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 4/29/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 1024 ABORT: 3/3

ITEM: PA OPERATE SWITCH  
FAILURE MODE: ELECTRICAL SHORT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND POWER AMPLIFIER
- 5) POWER AMPLIFIER OPERATE SWITCH
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7403

CAUSES: PIECE-PART FAILURE, VIBRATION, CONTAMINATION

EFFECTS/RATIONALE:

THE PA PNL PWR ("OPERATE") SWITCH PROVIDES POWER TO PA1 OR PA2 FOR S-BAND PM SYSTEM GCIL PNL CONTROL MODE. ELECTRICAL SHORT COULD PREVENT EITHER PA FROM GETTING POWER IN GCIL PNL MODE, AND PREVENT SWITCHING TO OTHER PA. PA (AND PREAMP) ARE REQUIRED FOR STDN HI AND TDRS MODES. OPERATIONAL REDUNDANCY EXISTS WITH THE SYSTEM IN GCIL CMD MODE. LOSS OF ALL CAPABILITY TO OPERATE IN HI PWR MODE WOULD FORCE SYSTEM OPERATION IN LO PWR MODE AND COULD REQUIRE ATTITUDE CONSTRAINTS THAT WOULD CAUSE LOSS OF MISSION OBJECTIVES AND THUS COULD CAUSE LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740129, VS70-740139; SSSH 16.1, 16.2; INCO/COMM SYSTEMS BRIEF 9.0; OMRSD V74 FILE III

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 4/03/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/3  
MDAC ID: 1025 ABORT: 3/3

ITEM: POWER AMPLIFIER STANDBY SWITCH  
FAILURE MODE: FAILS MID-TRAVEL, PHYSICAL BINDING/JAMMING

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND POWER AMPLIFIER
- 5) POWER AMPLIFIER STANDBY SWITCH
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7403

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE 3-POSITION STANDBY SWITCH (PA1/OFF/PA2) ALLOWS THE REDUNDANT PA TO BE IN HOT STANDBY WHILE THE OTHER IS ACTIVE IN THE S-BAND PM SYSTEM RL STRING FOR GCIL PNL MODE. IF STANDBY UNIT IS SUBSTITUTED THE 140-SECOND POWER TUBE WARMUP PERIOD WILL BE AVERTED, AND THE NEW LRU CAN BE OPERATIONAL INSTANTLY. LOSS OF PANEL CONTROL OF WARMUP WOULD NOT BE CRITICAL TO MISSION OR TO CREW/VEHICLE.

REFERENCES: SYSTEM SCHEMATIC VS70-740129, VS70-740139; SSSH 16.1, 16.2; INCO/COMM SYSTEMS BRIEF 9.0; OMRSD V74 FILE III

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 4/30/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/3  
MDAC ID: 1026 ABORT: 3/3

ITEM: PA STANDBY SWITCH  
FAILURE MODE: ELECTRICAL OPEN, ELECTRICAL SHORT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND POWER AMPLIFIER
- 5) POWER AMPLIFIER STANDBY SWITCH
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7403

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE 3-POSITION STANDBY SWITCH (PA1/OFF/PA2) ALLOWS THE REDUNDANT PA TO BE IN HOT STANDBY WHILE THE OTHER IS ACTIVE IN THE S-BAND, PM SYSTEM RL STRING FOR GCIL PNL MODE. IF STANDBY UNIT IS SUBSTITUTED THE 140-SECOND POWER TUBE WARMUP PERIOD WILL BE AVERTED, AND THE NEW LRU CAN BE OPERATIONAL INSTANTLY. LOSS OF PANEL CONTROL OF WARMUP WOULD NOT BE CRITICAL TO MISSION OR TO CREW/VEHICLE.

REFERENCES: SYSTEM SCHEMATIC VS70-740129, VS70-740139; SSSH 16.1, 16.2; INCO/COMM SYSTEMS BRIEF 9.0; OMRSD V74 FILE III

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/01/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 1027 ABORT: 3/1R

ITEM: S-BAND PM TRANSPONDER  
FAILURE MODE: LOSS OF UPLINK/FORWARD LINK OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND PM TRANSPONDER
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: ME478-0106-1001

CAUSES: PIECE-PART FAILURE, VIBRATION, TEMPERATURE EXTREME,  
CONTAMINATION

EFFECTS/RATIONALE:

THE TWO S-BAND PM TRANSPONDERS, USED ONE AT A TIME, PROVIDE TWO-WAY RF COMM WITH NASA AND DOD GROUND STATIONS AND WITH TDRS. THE UPLINK/FORWARD LINK (UL/FL) RF SIGNAL MAY BE MODULATED WITH OPERATIONAL VOICE, COMMANDS, AND TELEPRINTER DATA. THE UL/FL IS ALSO USED FOR TURNAROUND TONE RANGING AND FOR TWO-WAY DOPPLER TRACKING OF ORBITER. LOSS OF UL/FL DATA FROM BOTH TRANSPONDERS IN ON-ORBIT PHASE WOULD CAUSE MISSION ABORT BECAUSE ONLY THE KU-BAND FORWARD LINK WOULD REMAIN FOR COMMANDS, AND ONLY UHF VOICE FOR STATE VECTOR UPDATES AND TWO-WAY VOICE SUPPORT FOR DE-ORBIT/LANDING OPERATIONS. LOSS OF ALL CAPABILITY FOR SV UPDATES AND TWO-WAY VOICE FOR LANDING COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SYSTEM SCHEMATIC VS70-740129; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEF 5, 7; OMRSD V74 FILE III; JSC-12820 FLT  
RULES SECT 11

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/04/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 1028 ABORT: 3/1R

ITEM: S-BAND PM TRANSPONDER  
FAILURE MODE: UPLINK/FORWARD LINK FAILS OUT OF TOLERANCE

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND PM TRANSPONDER
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: ME478-0106-1001

CAUSES: PIECE-PART FAILURE, VIBRATION, TEMPERATURE EXTREME,  
CONTAMINATION

EFFECTS/RATIONALE:

THE TWO S-BAND PM XDNDRS, USED ONE AT A TIME, PROVIDE TWO-WAY RF COMM WITH NASA AND DOD GROUND STATIONS AND WITH TDRS. THE UL/FL RF SIGNAL MAY BE MODULATED WITH OPNL VOICE, CMDS, AND TELEPRINTER DATA. IT IS ALSO USED FOR TURNAROUND TONE RANGING AND TWO-WAY DOPPLER TRACKING. OUT-OF-TOLERANCE (E.G., FREQ. DRIFT, SIGNAL ATTENUATION) CONDITIONS CAUSING LOSS OF FUNCTION WOULD REQUIRE USE OF REDUNDANT LRU. LOSS OF ALL CAPABILITY FOR S-BAND PM UL/FL WOULD CAUSE MISSION TERMINATION BECAUSE ONLY KU-BAND FL WOULD REMAIN ON-ORBIT FOR CMDS, AND ONLY UHF VOICE FOR SV UPDATES AND TWO-WAY VOICE SUPPORT FOR DE-ORBIT/LANDING OPS. LOSS OF ALL CAPABILITY FOR SV UPDATES AND TWO-WAY VOICE FOR LANDING COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SYSTEM SCHEMATIC VS70-740129; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEF 5, 7; OMRSD V74 FILE III; JSC-12820 FLT  
RULES SECT 11

REPORT DATE 12/31/87

C-29

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/06/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 1029 ABORT: 3/1R

ITEM: S-BAND PM TRANSPONDER  
FAILURE MODE: ERRATIC/INTERMITTENT OPERATION OF UPLINK/FORWARD  
LINK

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND PM TRANSPONDER
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: ME478-0106-1001

CAUSES: PIECE-PART FAILURE, VIBRATION, MISHANDLING/ABUSE

EFFECTS/RATIONALE:

THE TWO S-BAND PM TRANSPONDERS, USED ONE AT A TIME, PROVIDE TWO-WAY RF COMM WITH NASA AND DOD GROUND STATIONS AND TDRS. THE UPLINK/FORWARD LINK (UL/FL) RF SIGNAL MAY BE MODULATED WITH OPERATIONAL VOICE, COMMANDS, AND TELEPRINTER DATA. THE UL/FL IS ALSO USED FOR TURNAROUND TONE RANGING AND FOR TWO-WAY DOPPLER TRACKING OF ORBITER. LOSS OF UL/FL DATA FROM BOTH TRANSPONDERS IN ON-ORBIT PHASE WOULD CAUSE MISSION ABORT BECAUSE ONLY THE KU-BAND FORWARD LINK WOULD REMAIN FOR COMMANDS, AND ONLY UHF VOICE FOR STATE VECTOR UPDATES AND TWO-WAY VOICE SUPPORT FOR DE-ORBIT/LANDING OPERATIONS. LOSS OF ALL CAPABILITY FOR SV UPDATES AND TWO-WAY VOICE FOR LANDING COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SYSTEM SCHEMATIC VS70-740129; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEF 5, 7; OMRSD V74 FILE III; JSC 12820 FLT  
RULES SECT 11

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/06/87  
SUBSYSTEM: COMM & TRACK  
MDAC ID: 1030

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: S-BAND PM TRANSPONDER  
FAILURE MODE: LOSS OF DOWNLINK/RETURN LINK OUTPUT

LEAD ANALYST: A.W. ADDIS

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND PM TRANSPONDER
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/1R	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	3/1R	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: ME478-0106-1001

CAUSES: PIECE-PART FAILURE, MISHANDLING/ABUSE, LOSS OF INPUT,  
CONTAMINATION, VIBRATION, TEMPERATURE EXTREME

EFFECTS/RATIONALE:

THE TWO S-BAND PM XPNDRS, USED ONE AT A TIME, PROVIDE TWO-WAY RF COMM WITH NASA AND DOD GROUND STATIONS AND WITH TDRS. THE DL/RL RF SIGNAL MAY BE MODULATED WITH OPNL VOICE AND TLM DATA, AND IS ALSO USED FOR TURNAROUND TONE RANGING AND FOR TWO-WAY DOPPLER TRACKING OF ORBITER. LOSS OF RL OUTPUT FROM BOTH XPNDRS IN ON-ORBIT PHASE WOULD CAUSE MIN DURATION FLIGHT AND WOULD CALL FOR IFM TO REPLACE ONE PM XPNDR WITH FM XMTR. FAILURE OF IFM WOULD CAUSE MISSION ABORT (NEXT PLS) BECAUSE OF LOSS OF TLM AND BECAUSE ONLY UHF WOULD REMAIN FOR SUPPORT OF LANDING OPS AND SV UPDATES. LOSS OF ALL CAPABILITY FOR SV UPDATES AND VOICE COMM FOR LANDING COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SYSTEM SCHEMATIC VS70-740129; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEF 5, 7; OMRSD V74 FILE III; JSC-12820 FLT  
RULES SECT 11

REPORT DATE 12/31/87

C-31

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/06/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 1031 ABORT: 3/1R

ITEM: S-BAND PM TRANSPONDER  
FAILURE MODE: DOWNLINK/RETURN LINK FAILS OUT-OF-TOLERANCE

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND PM TRANSPONDER
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: ME478-0106-1001

CAUSES: PIECE-PART FAILURE, VIBRATION, TEMPERATURE EXTREME,  
CONTAMINATION

EFFECTS/RATIONALE:

THE TWO S-BAND PM XPNDERS, USED SINGLY, PROVIDE TWO-WAY RF COMM WITH NASA AND DOD GND STATIONS AND TDRS. THE DL/RL RF SIGNAL MAY BE MODULATED WITH OPNL VOICE AND TLM DATA, AND IS ALSO USED FOR TURNAROUND TONE RANGING AND FOR TWO-WAY DOPPLER TRACKING OF ORBITER. OUT-OF-TOLERANCE CONDITIONS (E.G., FREQ. DRIFT) CAUSING LOSS OF RL OUTPUT FROM BOTH XPNDERS ON-ORBIT WOULD CAUSE MIN DURATION FLIGHT AND WOULD CALL FOR IFM TO REPLACE ONE PM XPNDR WITH FM XMTR. IFM FAILURE WOULD CAUSE MISSION ABORT (NEXT PLS) BECAUSE OF LOSS OF TLM AND BECAUSE ONLY UHF WOULD REMAIN FOR SUPPORT OF LANDING OPS AND SV UPDATES. LOSS OF ALL CAPABILITY FOR SV UPDATES AND VOICE COMM FOR LANDING COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SYSTEM SCHEMATIC VS70-740129; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEF 5, 7; OMRSD V74 FILE III; JSC-12820 FLT  
RULES SECT 11

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/06/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 1032 ABORT: 3/1R

ITEM: S-BAND PM TRANSPONDER  
FAILURE MODE: ERRATIC/INTERMITTENT OPERATION OF DOWNLINK/RETURN  
LINK

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND PM TRANSPONDER
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: ME478-0106-1001

CAUSES: PIECE-PART FAILURE, VIBRATION, MISHANDLING/ABUSE

EFFECTS/RATIONALE:

THE TWO S-BAND PM XPNDERS, USED ONE AT A TIME, PROVIDE TWO-WAY RF COMM WITH NASA AND DOD GROUND STATIONS AND WITH TDRS. THE DL/RL RF SIGNAL MAY BE MODULATED WITH OPNL VOICE AND TLM DATA, AND IS ALSO USED FOR TURNAROUND TONE RANGING AND FOR TWO-WAY DOPPLER TRACKING ORBITER. ERRATIC/INTERMITTENT OPERATION CAUSING LOSS OF RL OUTPUT FROM BOTH XPNDERS IN ON-ORBIT PHASE WOULD CAUSE MIN DURATION FLIGHT AND WOULD CALL FOR IFM TO REPLACE ONE PM XPNDR WITH FM XMTR. FAILURE OF IFM WOULD CAUSE MISSION ABORT (NEXT PLS) BECAUSE OF LOSS OF TLM AND BECAUSE ONLY UHF WOULD REMAIN FOR SUPPORT OF LANDING OPS AND SV UPDATES. LOSS OF ALL CAPABILITY FOR SV UPDATES AND VOICE COMM FOR LANDING COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SYSTEM SCHEMATIC VS70-740129; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEF 5, 7; OMRSD V74 FILE III; JSC-12820 FLT  
RULES SECT 11

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/07/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 1033 ABORT: 3/1R

ITEM: S-BAND PM TRANSPONDER POWER SWITCH  
FAILURE MODE: FAILS MID-TRAVEL, PHYSICAL BINDING/JAMMING, OPEN  
(ELECTRICAL), FAILS TO SWITCH

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND PM TRANSPONDER
- 5) TRANSPONDER POWER SWITCH
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: 36V73A1A2S16

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE THREE POSITION XPNDR POWER SWITCH (XPNDR 1/OFF/XPNDR 2) PROVIDES POWER TO EITHER XPNDR 1 OR 2 FOR GCIL PANEL CONTROL MODE. OPNL REDUNDANCY FOR POWERING THE XPNDERS EXISTS WITH THE S-BAND PM SYSTEM IN GCIL COMMAND MODE, WHICH IS THE NORMAL CONTROL MODE. OTHER UNLIKE REDUNDANCY FOR TWO-WAY OPERATIONAL DATA COMM WOULD NORMALLY EXIST DURING ON-ORBIT PHASE VIA KU-BAND. LOSS OF BOTH XPNDERS IN ON-ORBIT PHASE WOULD CAUSE MISSION TERMINATION BECAUSE ONLY KU-BAND WOULD REMAIN FOR OPERATIONAL COMMANDS AND TELEMETRY. UNAVAILABILITY OF BOTH XPNDERS AND UHF IN DE-ORBIT/LANDING PHASE COULD CAUSE LOSS OF CREW/VEHICLE BECAUSE OF INABILITY TO UPDATE STATE VECTOR AND TO SUPPORT LANDING OPS WITH TWO-WAY VOICE.

REFERENCES: SYSTEM SCHEMATIC VS70-740129; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEF 5, 7; OMRSD V74 FILE III; JSC-12820 FLT  
RULES SECT 11

REPORT DATE 12/31/87 C-34

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/07/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 1034 ABORT: 3/1R

ITEM: S-BAND PM TRANSPONDER POWER SWITCH  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) S-BAND PM TRANSPONDER
- 5) TRANSPONDER POWER SWITCH
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: 36V73A1A2S16

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE 3-POSITION XPNDR PWR SWITCH (XPNDR 1/OFF/XPNDR 2) PROVIDES POWER TO LRU 1 OR 2 FOR GCIL PNL MODE. OPNL REDUNDANCY FOR POWERING THE LRUS EXISTS WITH SYS IN GCIL CMD MODE, THE NORMAL CONTROL MODE. UNLIKE REDUNDANCY FOR TWO-WAY OPNL DATA COMM IS VIA KU-BAND. CURRENT-LIMITING RESISTORS AND DIODES PROTECT BUSSES BC1 AND BC2 FROM HARD SHORTS IN PNL MODE. A ONE-AMP FUSE PROTECTS EACH BUSS IN CMD MODE. LOSS OF BOTH XPNDRS IN BOTH PNL AND CMD MODES ON-ORBIT BECAUSE OF HARD INTERNAL SWITCH SHORTS WOULD CAUSE MISSION TERMINATION BECAUSE ONLY KU-BAND WOULD REMAIN FOR CMDS/TLM. UNAVAILABILITY OF BOTH LRUS AND UHF IN DE-ORBIT/LANDING COULD CAUSE LOSS OF CREW/VEHICLE (INABILITY TO UPDATE SV AND TO SUPPORT LANDING WITH 2-WAY VOICE).

REFERENCES: SYSTEM SCHEMATIC VS70-740129; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEF 5, 7; OMRSD V74 FILE III; JSC-12820 FLT  
RULES SECT 11

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/07/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 1035 ABORT: 3/1R

ITEM: S-BAND PM SYSTEM MODE SELECTOR  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, FAILS MID-TRAVEL,  
FAILS TO OPEN/CLOSE, PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL)

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) SYSTEM MODE SELECTOR
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: 36V73A1A2S6

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE S-BAND PM MODE SELECTOR PERMITS MANUAL SELECTION OF MODES: TDRS RANGING (NOT USED), TDRS DATA, STDN HI, STDN LO, SGLS (DOD) WITH THE SYSTEM IN GCIL PNL MODE. OPEN CONTACTS COULD PREVENT SELECTION OF PROPER SYSTEM CONFIGURATION AND ALSO PREVENT NSP 1 AND NPS 2 DATA XMIT ON ENABLE SIGNALS REQUIRED TO KEEP ACTIVE NSP AND XPNDR INTERFACED. OPERATIONAL REDUNDANCY EXISTS FOR ALL MISSION PHASES VIA GCIL CMD MODE (THE NORMAL MODE). LOSS OF CAPABILITY TO CONTROL THE SYSTEM EITHER IN PNL OR CMD WOULD CAUSE MISSION TERMINATION FOR ON-ORBIT BECAUSE ONLY KU-BAND WOULD REMAIN FOR OPNL CMDS & TLM AND ONLY UHF WOULD REMAIN FOR STATE VECTOR UPDATES FOR DE-ORBIT/LANDING. LOSS OF ALL PATHS FOR SV UPDATES COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SYSTEM SCHEMATIC VS70-740129; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEF 5, 7; OMRSD V74 FILE III; JSC-12820 FLT  
RULES SECT 11

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/07/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 1036 ABORT: 3/1R

ITEM: S-BAND PM SYSTEM MODE SELECTOR  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) SYSTEM MODE SELECTOR
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: 36VT3A1A2A6

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

MODE SELECTOR ALLOWS MAN SYS MODE SELECT WITH SYS IN GCIL PNL MODE. HARD SHORT TO GND, DECKS 5, 6 WOULD KILL NSP 1, NSP 2 DATA XMIT ON ENABLE DISCRETES REQUIRED TO KEEP ACTIVE NSP/XPNDR INTERFACED IN PNL MODE, AND ALSO DISABLE MANY NSP PNL CONTROL FUNCTIONS ALSO USING POWER FROM FLCA 2, FLCA 3. HARD SHORT TO GND IN OTHER DECKS WOULD KILL MNB, MNC VOLTAGES FOR PNL CONTROL OF SYSTEM MODES. OPNL REDUNDANCY EXISTS IN GCIL CMD MODE FOR ALL THOSE PNL CONTROL FUNCTIONS. INABILITY TO CONTROL IN PNL OR CMD ON-ORBIT WOULD CAUSE MISSION LOSS (ONLY KU-BAND WOULD REMAIN FOR CMDS & TLM, ONLY UHF FOR SV UPDATES, DEORBIT/LNDG). LOSS OF ALL PATHS FOR SV COULD CAUSE CREW/VEHICLE LOSS.

REFERENCES: SYSTEM SCHEMATIC VS70-740229, VS70-740299; SSSH 16.1, 16.3; INCO/COMM SYSTEMS BRIEF 3, 6, 27; FLIGHT RULES JSC 12820 SECTION II; OMRSD V74 FILE III; JSC-12820 FLT RULES SECT 11

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/3  
MDAC ID: 1037 ABORT: 3/3

ITEM: S-BAND PM SIGNAL STRENGTH SELECTOR SWITCH  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, FAILS MID-TRAVEL,  
FAILS TO OPEN/CLOSE, PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL),  
FAILS TO SWITCH

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) SIGNAL STRENGTH METER SWITCH/CIRCUIT
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL F9  
PART NUMBER: 34V73A9A2S2, 34V73A9A2M3

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE SELECTOR/METER AND ASSOCIATED CIRCUITRY PROVIDE THE PILOT WITH A MEANS OF DETERMINING RELATIVE RF SIGNAL STRENGTH OF THE S-BAND PM SIGNAL RECEIVED ABOARD ORBITER. LOSS OF THE INDICATION WOULD NOT BE CRITICAL. AN ALTERNATE INDICATION WOULD BE AVAILABLE ON A METER ON PANEL A1, AND ALSO ON "SM OPS 201 ANTENNA" DISPLAY ON THE CRTS.

REFERENCES: SYSTEM SCHEMATIC VS70-740129; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEF 5, 7

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C-38

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/3  
MDAC ID: 1038 ABORT: 3/3

ITEM: S-BAND PM SIGNAL STRENGTH SELECTOR  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) SIGNAL STRENGTH METER SWITCH/CIRCUIT
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL F9  
PART NUMBER: 34V73A9A2S2

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE SELECTOR/METER AND ASSOCIATED CIRCUITRY PROVIDE THE PILOT WITH A MEANS OF DETERMINING RELATIVE RF SIGNAL STRENGTH OF THE S-BAND PM SIGNAL RECEIVED ABOARD ORBITER. LOSS OF THE INDICATION WOULD NOT BE CRITICAL. AN ALTERNATE INDICATION WOULD BE AVAILABLE ON A METER ON PANEL A1, AND ALSO ON "SM OPS 201 ANTENNA" DISPLAY ON THE CRTS. A SHORT CIRCUIT TO GROUND AT THE INPUT TO THE BUFFER AMPLIFIER FEEDING THE METER COULD KILL THE SIGNAL FOR THE PANEL A1 METER, AND ALSO COULD AFFECT THE AGC CIRCUIT PROVIDING THE SIGNAL, ALSO KILLING THE SIGNAL USED FOR THE SM OPS 201 ANTENNA DISPLAY.

REFERENCES: SYSTEM SCHEMATIC VS70-740129; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEF 5, 7

REPORT DATE 12/31/87

C-39

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/3  
MDAC ID: 1039 ABORT: 3/3

ITEM: SIGNAL STRENGTH METER SELECTOR SWITCH AND CIRCUIT  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, FAILS MID-TRAVEL,  
FAILS TO OPEN/CLOSE, PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL),  
FAILS TO SWITCH

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) SIGNAL STRENGTH METER SWITCH/CIRCUIT
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: 36V73A1A1S2

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE THREE-POSITION SELECTOR SWITCH PERMITS THE CREW TO DETERMINE RELATIVE RF SIGNAL STRENGTH OF THE RECEIVED SIGNALS FOR S-BAND PM, S-BAND PAYLOAD, AND KU-BAND RF SYSTEMS. LOSS OF ANY OF THE INDICATIONS WOULD NOT BE CRITICAL. ALTERNATE INDICATIONS WOULD BE AVAILABLE FOR S-BAND PM AND KU-BAND ON "SM OPS 201 ANTENNA" DISPLAY AND FOR S-BAND PAYLOAD ON "SPEC 62 PCMMU/PL COMM" VIA CRT, AND FOR S-BAND PM ALSO ON PANEL F9. IN ALL, FIVE RECEIVERS CAN PROVIDE READINGS FOR THE METERS AND DISPLAYS: TWO S-BAND PM XPNDR RECEIVERS, TWO PAYLOAD INTERROGATOR RECEIVERS, AND ONE KU-BAND RECEIVER.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, VS70-740129, V70-740239; SSSH 16.1, 16.2; INCO/COMM SYSTEMS BRIEF 5, 7, 18, 34

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/3  
MDAC ID: 1040 ABORT: 3/3

ITEM: SIGNAL STRENGTH METER SELECTOR SWITCH AND CIRCUIT  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) RF COMM
- 4) SIGNAL STRENGTH METER SWITCH/CIRCUIT
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: 36V73A1A1S1

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE THREE-POSITION SELECTOR SWITCH PERMITS THE CREW TO DETERMINE RELATIVE RF SIGNAL STRENGTH OF THE RECEIVED SIGNALS FOR S-BAND PM, S-BAND PAYLOAD, AND KU-BAND SYSTEMS. LOSS OF ANY OF THE INDICATIONS WOULD NOT BE CRITICAL. ALTERNATE INDICATIONS WOULD BE AVAILABLE FOR S-BAND PM AND KU-BAND ON "SM OPS 201 ANTENNA" DISPLAY AND FOR S-BAND PAYLOAD ON "SPEC 62 PCMMU/PL COMM" VIA CRT AND FOR S-BAND PM ALSO ON PANEL F9. A SHORT TO GROUND ON THE AGC LINE FROM A RECEIVER FOR ANY OF THE THREE SYSTEMS COULD AFFECT THE AGC CIRCUIT FOR THAT RECEIVER AND KILL ITS OUTPUT, CAUSING LOSS OF THE ASSOCIATED REFERENCE SIGNAL FOR TELEMETRY AND FOR INDICATIONS ON THE METER(S) AND ON THE CRT DISPLAY FOR THAT RECEIVER.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, VS70-740129, V70-740239; SSSH 16.1, 16.2; INCO/COMM SYSTEMS BRIEFS 5, 7, 18, 34

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C-41

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/11/87  
SUBSYSTEM: COMM & TRACK  
MDAC ID: 1041

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 3/3

ITEM: S-BAND PM SYSTEM PANEL/COMMAND GCIL SWITCH  
FAILURE MODE: FAILS TO OPEN/CLOSE, PHYSICAL BINDING/JAMMING,  
OPEN (ELECTRICAL)

LEAD ANALYST: A.W. ADDIS

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) GROUND COMMAND INTERFACE LOGIC
- 4) S-BAND PM SYSTEM PANEL/COMMAND SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL C3  
PART NUMBER: 35V73A3A7S9

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE GCIL PNL/CMD SWITCH PERMITS PNL CONTROL OF THE SYSTEM AND NSPS VIA PNL SWITCHES WHEN IN PNL POSITION AND VIA GCIL GND CMDS OR SSO KYBD ENTRIES IN CMD POSITION. NORMAL MODE IS CMD. FOR FAILURE IN CMD MODE PNL MODE WOULD BE SELECTED. LOSS OF ALL CAPABILITY TO CONTROL S-BAND PM/NSP MODE/CONFIG IN CMD OR PNL COULD CAUSE MISSION TERMINATION.

REFERENCES: SCHEMATIC V70-740299; SSSH 16.1; INCO/COMM SYSTEM BRIEF 3, FLIGHT RULES JSC-12820 SECTION 11; OMRSD V74 FILE III

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C-42

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/04/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 1042 ABORT: 3/1R

ITEM: S-BAND PM/NSP SYSTEM PNL/CMD GCIL SWITCH  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM/NSP SYSTEM
- 3) SIGNAL PROCESSING
- 4) GROUND COMMAND INTERFACE LOGIC
- 5) PANEL/COMMAND SWITCH
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL C3  
PART NUMBER: 35V73A3A7S9

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE S-BAND PM/NSP SYSTEM "PNL/CMD" GCIL SWITCH PERMITS CREW CONTROL OF THE SYSTEM VIA PANEL SWITCHES IN "PNL" AND CONTROL VIA GCIL GROUND COMMANDS OR ORBITER KEYBOARD ENTRIES IN "CMD". A HARD INTERNAL SWITCH SHORT TO GROUND COULD TRIP CB44 (MNA) AND CB49 (MNC) ON PANEL R15, DISABLING "COMMAND" MODE FOR ALL FIVE GCIL-CONTROLLED C&T SYSTEMS, INCLUDING S-BAND PM/NSP SYSTEM. THE SYSTEMS WOULD THEN REVERT TO THE OPERATIONALLY REDUNDANT "PANEL" CONTROL MODE. LOSS OF THAT REDUNDANCY WOULD DISABLE THE NSPS, LEAVING ONLY UHF UPLINK VOICE FOR STATE VECTOR UPDATE. LOSS OF ALL CAPABILITY FOR SV UPDATE COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SCHEMATIC V70-740299; SSSH 16.1; INCO/COMM SYSTEM BRIEF 3, FLIGHT RULES JSC-12820 SECTION 11; OMRSD V74 FILE III

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C-2

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 1043 ABORT: 3/1R

ITEM: NETWORK SIGNAL PROCESSOR, UL SECTION  
FAILURE MODE: OPEN (ELECTRICAL), LOSS OF OUTPUT, SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) SIGNAL PROCESSING
- 4) NETWORK SIGNAL PROCESSOR
- 5) NSP UL SECTION
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC476-0137-0001

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

THE UPLINK SECTION OF THE NSP RECEIVES BASEBAND FROM THE S-BAND PM UL (ALL PHASES) OR THE KU-BAND FORWARD LINK (ON-ORBIT ONLY), PROCESSES IT, AND ROUTES OPERATIONAL VOICE AND/OR TELEPRINTER DATA TO THE ORBITER AUDIO SYSTEM AND COMMANDS TO DATA PROCESSING. ON LOSS OF ACTIVE NSP UL SECTION, THE REDUNDANT NSP WOULD BE SELECTED. LOSS OF THE SECOND UL PATH WOULD INVOKE MINIMUM DURATION FLIGHT RULE BECAUSE ONLY ONE PATH, UHF, WOULD REMAIN FOR STATE VECTOR UPDATES AND FOR UL VOICE COMM FOR LANDING. LOSS OF ALL PATHS FOR SV UPDATE COULD CAUSE LOSS OF CREW/VEHICLE FOR DE-ORBIT/LANDING AND FOR AOA OR ATO.

REFERENCES: SCHEMATIC VS70-740129, VS70-740229; SSSH 16.1, 16.2, 16.3; INCO/COMM SYSTEMS BRIEF 6; FLIGHT RULES JSC-12820, SECTION 11; OMRSD V74 FILE III

REPORT DATE 12/31/87

C-44

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 1044 ABORT: 3/1R

ITEM: NETWORK SIGNAL PROCESSOR, UL SECTION  
FAILURE MODE: ERRATIC OPERATION, INTERMITTENT OPERATION

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) SIGNAL PROCESSING
- 4) NETWORK SIGNAL PROCESSOR
- 5) NSP UL SECTION
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC476-0137-0001

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

THE UPLINK SECTION OF THE NSP RECEIVES BASEBAND FROM THE S-BAND PM UL (ALL PHASES) OR THE KU-BAND FORWARD LINK (ON-ORBIT ONLY), PROCESSES IT, AND ROUTES OPERATIONAL VOICE AND/OR TELEPRINTER DATA TO THE ORBITER AUDIO SYSTEM AND COMMANDS TO DATA PROCESSING. ON LOSS OF ACTIVE NSP UL SECTION, THE REDUNDANT NSP WOULD BE SELECTED. LOSS OF THE SECOND NSP UL SECTION WOULD INVOKE MINIMUM DURATION FLIGHT RULE BECAUSE ONLY ONE PATH, UHF, FOR STATE VECTOR UPDATES AND FOR UL VOICE COMM FOR LANDING WOULD REMAIN. LOSS OF ALL PATHS FOR SV UPDATE COULD CAUSE LOSS OF CREW/VEHICLE FOR DE-ORBIT/LANDING AND FOR AOA OR ATO.

REFERENCES: SCHEMATIC VS70-740129, VS70-740229; SSSH 16.1, 16.2, 16.3; INCO/COMM SYSTEMS BRIEF 6; FLIGHT RULES JSC-12820, SECTION 11; OMRSD V74 FILE III

REPORT DATE 12/31/87

C-45

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 2/1R  
MDAC ID: 1045 ABORT: 3/1R

ITEM: NETWORK SIGNAL PROCESSOR, DL SECTION  
FAILURE MODE: OPEN (ELECTRICAL), LOSS OF OUTPUT, SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) SIGNAL PROCESSING
- 4) NETWORK SIGNAL PROCESSOR
- 5) NSP DL SECTION
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC476-0137-0001

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

THE DOWNLINK (DL) SECTION OF THE NSP MULTIPLEXES OPERATIONAL TELEMETRY DATA AND VOICE, CONVERTS THE MULTIPLEXED DATA TO EITHER NRZ OR BI-PHASE, AND ROUTES IT TO THE TRANSMITTER (S-BAND PM AND/OR KU-BAND) FOR TRANSMISSION TO GROUND FOR AOS AND TO OPS RECORDER FOR LOS. ON LOSS OF THE ACTIVE NSP DL, MINIMUM DURATION FLIGHT RULE WOULD BE INVOKED BECAUSE ONLY ONE NSP PATH WOULD REMAIN FOR DOWNLINK/RETURN LINK TELEMETRY (INCLUDING ORBITER STATE VECTOR STATUS). LOSS OF THE REDUNDANT NSP DL WOULD CAUSE MISSION TERMINATION BECAUSE ONLY ONE SYSTEM (UHF) WOULD REMAIN FOR SV UPDATES AND FOR TWO-WAY VOICE FOR LANDING OPERATIONS. LOSS OF ALL PATHS FOR SV UPDATES AND TWO-WAY VOICE FOR LANDING COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SCHEMATIC VS70-740129, VS70-740229; SSSH 16.1, 16.2, 16.3; INCO/COMM SYSTEMS BRIEF 6; FLIGHT RULES JSC-12820, SECTION 11; OMRSD V74 FILE III

REPORT DATE 12/31/87

C-46

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 2/1R  
MDAC ID: 1046 ABORT: 3/1R

ITEM: NETWORK SIGNAL PROCESSOR, DL SECTION  
FAILURE MODE: INTERMITTENT OPERATION, ERRATIC OPERATION

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) SIGNAL PROCESSING
- 4) NETWORK SIGNAL PROCESSOR
- 5) NSP DL SECTION
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC476-0137-0001

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

THE DOWNLINK (DL) SECTION OF THE NSP MULTIPLEXES OPERATIONAL TELEMETRY DATA AND VOICE, CONVERTS THE MULTIPLEXED DATA TO EITHER NRZ OR BI-PHASE, AND ROUTES IT TO THE TRANSMITTER (S-BAND PM AND/OR KU-BAND) FOR TRANSMISSION TO GROUND FOR AOS AND TO OPS RECORDER FOR LOS. ON LOSS OF THE ACTIVE NSP DL, MINIMUM DURATION FLIGHT RULE WOULD BE INVOKED BECAUSE ONLY ONE NSP PATH WOULD REMAIN FOR DOWNLINK/RETURN LINK TELEMETRY (INCLUDING ORBITER STATE VECTOR STATUS). LOSS OF THE REDUNDANT NSP DL WOULD CAUSE MISSION TERMINATION BECAUSE ONLY ONE SYSTEM (UHF) WOULD REMAIN FOR SV UPDATES AND FOR TWO-WAY VOICE FOR LANDING OPERATIONS. LOSS OF ALL PATHS FOR SV UPDATES AND TWO-WAY VOICE FOR LANDING COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SCHEMATIC VS70-740129, VS70-740229; SSSH 16.1, 16.2, 16.3; INCO/COMM SYSTEMS BRIEF 6; FLIGHT RULES JSC-12820, SECTION 11; OMRSD V74 FILE III

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/27/87  
SUBSYSTEM: COMM & TRACK  
MDAC ID: 1047

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 3/3

ITEM: COMSEC  
FAILURE MODE: OPEN (ELECTRICAL), LOSS OF OUTPUT, SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) SIGNAL PROCESSING
- 4) COMSEC
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/2R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: KGX-60

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

THE KGX-60 COMSEC SYSTEM HAS TWO IDENTICAL (REDUNDANT) TRANSMIT/RECEIVE SETS, USED ONE AT A TIME. COMSEC 1 IS DEDICATED TO NSP 1 AND COMSEC 2 TO NSP 2 (NO CROSS-STRAPPING CAPABILITY). THE ACTIVE T/R SET WORKS WITH ITS ASSOCIATED NSP TO PROVIDE ENCRYPTION/DECRYPTION DATA PROCESSING FOR DOD AND NASA SECURE OPERATIONS FOR VARIOUS COMBINATIONS - TRANSMIT/RECEIVE, RECEIVE-ONLY, OR RECORDING OF OPERATIONAL DATA. LOSS OF ALL CAPABILITY FOR SECURE OPERATIONS COULD CAUSE LOSS OF MISSION FOR SOME FLIGHTS.

REFERENCES: SCHEMATIC VS70-740129, VS70-740229. VS70-740299; SSSH 16.1, 16.2, 16.3; INCO/COMM SYSTEMS BRIEF 6, 27; FLIGHT RULES JSC-12820, SECTION 11; OMRSD V74 FILE III

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/27/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 1048 ABORT: 3/3

ITEM: COMSEC  
FAILURE MODE: ERRATIC OPERATION, INTERMITTENT OPERATION

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) SIGNAL PROCESSING
- 4) COMSEC
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: KGX-60

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

THE KGX-60 COMSEC SYSTEM HAS TWO IDENTICAL (REDUNDANT) TRANSMIT/RECEIVE SETS, USED ONE AT A TIME. COMSEC 1 IS DEDICATED TO NSP 1 AND COMSEC 2 TO NSP 2 (NO CROSS-STRAPPING CAPABILITY). THE ACTIVE T/R SET WORKS WITH ITS ASSOCIATED NSP TO PROVIDE ENCRYPTION/DECRYPTION DATA PROCESSING FOR DOD AND NASA SECURE OPERATIONS FOR VARIOUS COMBINATIONS - TRANSMIT/RECEIVE, RECEIVE-ONLY, OR RECORDING OF OPERATIONAL DATA. LOSS OF ALL CAPABILITY FOR SECURE OPERATIONS COULD CAUSE LOSS OF MISSION FOR SOME FLIGHTS.

REFERENCES: SCHEMATIC VS70-740129, VS70-740229. VS70-740299;  
SSSH 16.1, 16.2, 16.3; INCO/COMM SYSTEMS BRIEF 6, 27; FLIGHT  
RULES JSC-12820, SECTION 11; OMRSD V74 FILE III

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/27/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/3  
MDAC ID: 1049 ABORT: 3/3

ITEM: NSP ENCRYPTION POWER ON-OFF SWITCH  
FAILURE MODE: FAILS MID-TRAVEL, PHYSICAL BINDING/JAMMING, FAILS  
TO SWITCH

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) SIGNAL PROCESSING
- 4) COMSEC
- 5) ENCRYPTION ON-OFF SWITCH
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7201

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE NSP ENCRYPTION POWER SWITCH PROVIDES CONTROL BUS AB1 VOLTAGE TO CONTROL REDUNDANT, SIMULTANEOUS MNA AND MNB POWER TO COMSEC 1 AND CONTROL BUS AB3 VOLTAGE TO CONTROL REDUNDANT, SIMULTANEOUS MNA AND MNB POWER TO COMSEC 2. LOSS OF CAPABILITY TO ENERGIZE COMSEC STRINGS 1 AND 2 COULD CAUSE LAUNCH DELAY, BECAUSE OF INABILITY TO LOAD THE COMSEC KEY.

REFERENCES: SCHEMATIC VS70-740129, VS70-740229. VS70-740299;  
SSSH 16.1, 16.2, 16.3; INCO/COMM SYSTEMS BRIEF 6, 27; FLIGHT  
RULES JSC-12820, SECTION 11

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/27/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 2/2  
MDAC ID: 1050 ABORT: 3/3

ITEM: NSP ENCRYPTION POWER ON-OFF SWITCH  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, OPEN (ELECTRICAL),  
LOSS OF OUTPUT, SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) SIGNAL PROCESSING
- 4) COMSEC
- 5) ENCRYPTION ON-OFF SWITCH
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT		HDW/FUNC
PRELAUNCH:	3/3	RTLS:		3/3
LIFTOFF:	3/3	TAL:		3/3
ONORBIT:	2/2	AOA:		3/3
DEORBIT:	3/3	ATO:		3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7201

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS SWITCH APPLIES CONTROL BUS VOLTAGES (AB1 AND AB3) TO FWD PCA2 TO PERMIT APPLICATION OF SIMULTANEOUS MNA AND MNB POWER TO COMSEC 1 AND COMSEC 2. A FAILURE IN THE SWITCH RESULTING IN LOSS OF ALL POWER TO BOTH COMSEC 1 AND COMSEC 2 (INTERNAL OPENS OR SHORTS) WOULD RESULT IN LOSS OF ENCRYPTION/DECRYPTION CAPABILITY FOR MISSION BECAUSE LOSS OF POWER TO BOTH COMSEC BOXES WOULD CAUSE LOSS OF ENCRYPTION/DECRYPTION KEYS. LOSS OF ENCRYPTION/DECRYPTION CAPABILITY COULD CAUSE LOSS OF MISSION. THERE IS NO REDUNDANCY FOR THE FUNCTION OF THIS SWITCH.

REFERENCES: SCHEMATIC VS70-740129, VS70-740229. VS70-740299; SSSH 16.1, 16.2, 16.3; INCO/COMM SYSTEMS BRIEF 6, 27; FLIGHT RULES JSC-12820, SECTION 11

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/27/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 2/2  
MDAC ID: 1051 ABORT: 3/3

ITEM: NSP ENCRYPTION MODE SWITCH  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, FAILS MID-TRAVEL,  
PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL), LOSS OF OUTPUT,  
FAILS TO SWITCH

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) SIGNAL PROCESSING
- 4) NSP
- 5) ENCRYPTION MODE SWITCH
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7401

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS SWITCH PROVIDES PNL CONTROL TO SELECT NSP MODES IN WHICH OPNL DATA IS ROUTED VIA COMSEC TO BE ENCRYPTED/DECRYPTED. IN "ALL" (DOD MODE), REAL-TIME XMIT & RCV DATA (CMDS, VCE, & TLM) ARE ENCRYPTED/DECRYPTED; FOR PLAYBACK, DOWNLINK TLM & VCE ARE ENCRYPTED FOR TRANSMISSION TO GROUND. IN "SELECT" (NASA MODE), ANOTHER PANEL SWITCH SELECTS THREE DIFFERENT COMBINATIONS OF "ENCRYPTED" OR "CLEAR" (UNENCRYPTED) OPS FOR XMIT, RCV, AND RECORD FUNCTIONS. FOR SECURITY, THERE ARE NO CMDS FOR SELECTION OF "ALL" OR "SELECTED". THERE IS NO HARDWARE REDUNDANCY FOR THE SWITCH'S FUNCTION. LOSS OF CAPABILITY TO SELECT OPNL MODE FOR ENCRYPT/DECRYPT ON SSO COULD CAUSE MISSION LOSS FOR SOME FLIGHTS.

REFERENCES: SCHEMATIC VS70-740229. VS70-740299; SSSH 16.1, 16.3; INCO/COMM SYSTEMS BRIEF 6, 27; FLIGHT RULES JSC-12820, SECTION 11

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/27/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 2/2  
MDAC ID: 1052 ABORT: 3/3

ITEM: NSP ENCRYPTION MODE SWITCH  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) SIGNAL PROCESSING
- 4) NSP
- 5) ENCRYPTION MODE SWITCH
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7401

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS SWITCH PROVIDES PNL CONTROL TO SELECT NSP MODES IN WHICH OPNL DATA IS ROUTED VIA COMSEC TO BE ENCRYPTED/DECRYPTED. IN "ALL" (DOD MODE), REAL-TIME XMIT & RCV DATA (CMDS, VCE, & TLM) ARE ENCRYPTED/DECRYPTED; FOR PLAYBACK, DOWNLINK TLM & VCE ARE ENCRYPTED FOR TRANSMISSION TO GROUND. IN "SELECT" (NASA MODE), ANOTHER PANEL SWITCH SELECTS THREE DIFFERENT COMBINATIONS OF "ENCRYPTED" OR "CLEAR" (UNENCRYPTED) OPS FOR XMIT, RCV, AND RECORD FUNCTIONS. FOR SECURITY, THERE ARE NO CMDS FOR SELECTION OF "ALL" OR "SELECTED". THERE IS NO HARDWARE REDUNDANCY FOR THE SWITCH'S FUNCTION. LOSS OF CAPABILITY TO SELECT OPNL MODE FOR ENCRYPT/DECRYPT ON SSO COULD CAUSE MISSION LOSS FOR SOME FLIGHTS.

REFERENCES: SCHEMATIC VS70-740229. VS70-740299; SSSH 16.1, 16.3; INCO/COMM SYSTEMS BRIEF 6, 27; FLIGHT RULES JSC-12820, SECTION 11

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/29/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 2/2  
MDAC ID: 1053 ABORT: 3/3

ITEM: NSP ENCRYPTION SELECT SWITCH  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, FAILS MID-TRAVEL,  
PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL), FAILS TO SWITCH

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) SIGNAL PROCESSING
- 4) NSP
- 5) ENCRYPTION SELECT SWITCH
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7406

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS SWITCH WORKS IN SERIES WITH THE "ALL" (NASA) POSITION OF THE "NSP ENCRYPTION MODE" SWITCH TO PERMIT SELECTION OF 3 OPNL MODES FOR NASA. IN "T/R" POSITION XMIT AND RCV OPNL DATA AND HIGH DATA RATE RECORDED DATA ARE ROUTED BY NSP VIA COMSEC; IN "RCV" ONLY RCV (UL) DATA ARE SO ROUTED; AND IN "BYPASS" XMIT, RCV AND HIGH DATA RATE DATA BYPASS THE COMSEC (CLEAR MODE). THERE IS NO HARDWARE REDUNDANCY FOR THE SWITCH, NOR IS THERE OPNL REDUNDANCY BY CMDS. POLICY HAS BEEN TO ENCRYPT CMDS AND LOADS TO PROTECT AGAINST UNAUTHORIZED FL DATA. LOSS OF FL SECURITY VIA COMSEC CAN BE PARTLY COMPENSATED FOR BY USE OF THE "UPLINK BLOCK" SWITCH, BUT LOSS OF FL SECURE OPS COULD CAUSE LOSS OF MISSION.

REFERENCES: SCHEMATIC VS70-740229. VS70-740299; SSSH 16.1, 16.3; INCO/COMM SYSTEMS BRIEF 6, 27; FLIGHT RULES JSC-12820, SECTION 11

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/29/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 2/2  
MDAC ID: 1054 ABORT: 3/3

ITEM: NSP ENCRYPTION SELECT SWITCH  
FAILURE MODE: OPEN (ELECTRICAL), LOSS OF OUTPUT, SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) SIGNAL PROCESSING
- 4) NSP
- 5) ENCRYPTION SELECT SWITCH
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7406

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS SWITCH WORKS IN SERIES WITH THE "ALL" (NASA) POSITION OF THE "NSP ENCRYPTION MODE" SWITCH TO PERMIT SELECTION OF 3 OPNL MODES FOR NASA. IN "T/R" POSITION XMIT AND RCV OPNL DATA AND HIGH DATA RATE RECORDED DATA ARE ROUTED BY NSP VIA COMSEC; IN "RCV" ONLY RCV (UL) DATA ARE SO ROUTED; AND IN "BYPASS" XMIT, RCV AND HIGH DATA RATE DATA BYPASS THE COMSEC (CLEAR MODE). THERE IS NO HARDWARE REDUNDANCY FOR THE SWITCH, NOR IS THERE OPNL REDUNDANCY BY CMDS. POLICY HAS BEEN TO ENCRYPT CMDS AND LOADS TO PROTECT AGAINST UNAUTHORIZED FL DATA. LOSS OF FL SECURITY VIA COMSEC CAN BE PARTLY COMPENSATED FOR BY USE OF THE "UPLINK BLOCK" SWITCH, BUT LOSS OF FL SECURE OPS COULD CAUSE LOSS OF MISSION.

REFERENCES: SCHEMATIC VS70-740229. VS70-740299; SSSH 16.1, 16.3; INCO/COMM SYSTEMS BRIEF 6, 27; FLIGHT RULES JSC-12820, SECTION 11

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/29/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/3  
MDAC ID: 1055 ABORT: 3/3

ITEM: ENCRYPTION ZEROIZE/NORMAL SWITCH  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, FAILS MID-TRAVEL,  
PHYSICAL BINDING/JAMMING, OPEN (ELECTRICA), FAILS TO SWITCH

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) SIGNAL PROCESSING
- 4) NSP
- 5) ENCRYPTION ZEROIZE/NORMAL SWITCH
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL R12  
PART NUMBER: ME452-0102-7463

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS SWITCH IS USED TO RENDER THE COMSEC LRU FUNCTIONALLY INOPERABLE (BOTH TRANSMIT AND RECEIVE) UNTIL THE RAM IS RESTORED BY LOADING A KEY INTO IT. (THE KEY IS ALSO ZEROIZED BY REMOVING POWER TO THE COMSEC LRU WITH THE NSP ENCRYPTION POWER SWITCH.) ZEROIZING INITIALIZES THE LRUS, SETTING ALL KEY LOGIC ELEMENTS TO THE ZERO STATE. THIS IS A GROUND OPERATION, DONE POST-FLIGHT AND PRE-LAUNCH IN PREPARATION FOR LOADING A KEY INTO THE RAM. LOSS OF THE FUNCTION IN PRE-LAUNCH COULD CAUSE A LAUNCH DELAY.

REFERENCES: SCHEMATIC VS70-740229. VS70-740299; SSSH 16.1, 16.3; INCO/COMM SYSTEMS BRIEF 6, 27; FLIGHT RULES JSC-12820, SECTION 11

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/01/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 2/2  
MDAC ID: 1056 ABORT: 3/3

ITEM: ENCRYPTION ZEROIZE/NORMAL SWITCH  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM SYSTEM
- 3) SIGNAL PROCESSING
- 4) NSP
- 5) ENCRYPTION ZEROIZE/NORMAL SWITCH
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL R12  
PART NUMBER: ME452-0102-7463

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS SWITCH IS USED TO INITIALIZE THE COMSEC LRUS BY SETTING ALL ENCRYPTION KEY LOGIC ELEMENTS TO THE ZERO STATE. THE ZEROIZING IS ACCOMPLISHED IN EACH ENCRYPT/DECRYPT SECTION OF COMSEC 1 AND 2 BY GROUNDING A CIRCUIT VIA THE ZEROIZE SWITCH. INADVERTENT SHORTING INSIDE THE SWITCH BODY COULD GROUND BOTH CIRCUITS AND THUS REMOVE THE KEY, RENDERING THE COMSEC LRUS INOPERABLE. THAT WOULD FORCE THE SYSTEM TO BE OPERATED IN THE "CLEAR" MODE, AND COULD CAUSE LOSS OF MISSION.

REFERENCES: SCHEMATIC VS70-740229. VS70-740299; SSSH 16.1, 16.3; INCO/COMM SYSTEMS BRIEF 6, 27; FLIGHT RULES JSC-12820, SECTION 11

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/02/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 1057 ABORT: 3/1R

ITEM: NSP UPLINK DATA SOURCE SWITCH  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, FAILS MID-TRAVEL,  
PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL), FAILS TO SWITCH

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM/NSP SYSTEM
- 3) UPLINK DATA SOURCE SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7201

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

WITH THE S-BAND PM/NSP SYSTEM IN THE GCIL "PANEL" MODE, THIS SWITCH PERMITS PANEL SELECTION OF EITHER S-BAND PM OR KU-BAND AS THE SOURCE FOR FORWARD LINK OPERATIONAL DATA. IN "COMMAND" MODE, SELECTION IS EITHER BY GCIL GROUND COMMANDS OR BY KEYBOARD INPUT ABOARD ORBITER. COMMAND MODE IS THE NORMAL OPERATIONAL MODE FOR THE S-BAND PM/NSP SYSTEM, WITH PANEL MODE THE ALTERNATE. LOSS OF ALL CAPABILITY TO SELECT EITHER S-BAND PM OR KU-BAND FORWARD LINK AS DATA SOURCE BECAUSE OF SWITCH FAILURE WOULD REQUIRE STATE VECTOR (SV) UPDATES VIA UHF UPLINK VOICE. LOSS OF ALL CAPABILITY FOR SV UPDATES COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SCHEMATIC VS70-740229. VS70-740299; SSSH 16.1, 16.3; INCO/COMM SYSTEMS BRIEF 3, 6, 27; FLIGHT RULES JSC-12820, SECTION 11; OMRSD V74 FILE III

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/02/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 1058 ABORT: 3/1R

ITEM: NSP UPLINK DATA SOURCE SWITCH  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM/NSP SYSTEM
- 3) UPLINK DATA SOURCE SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/1R	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	3/1R	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7201

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

IN GCIL PNL MODE THIS SWITCH SELECTS S-BAND PM OR KU-BAND AS SOURCE FOR FL DATA. IN CMD MODE, SELECTION IS BY GCIL GND CMD OR BY KYBD. CMD MODE IS NORMAL OPNL MODE WITH PNL MODE THE ALTERNATE. A HARD SHORT TO GND IN SWITCH COULD KILL PWR FROM FLCA2 AND FLCA3, DISABLING NUMEROUS NSP CONFIGURATION PNL CONTROL SELECTOR CIRCUITS (E.G., UL DATA SOURCE, NSP DATA RATE XMIT AND RCV, NSP CODING XMIT AND RCV, NSP ENCRYPTION MODE). IT WOULD ALSO KILL "DATA XMIT ON NSP 1" AND "DATA XMIT ON NSP 2" SIGNALS REQUIRED BY XPNDRS 1 AND 2 FOR DL XMIT FOR PNL MODE. LOSS OF PATHS FOR VCE COMM & SV UPDATES VIA NSP CMD MODE AND VIA UHF COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SCHEMATIC VS70-740229. VS70-740299; SSSH 16.1, 16.3; INCO/COMM SYSTEMS BRIEF 3, 6, 27; FLIGHT RULES JSC-12820, SECTION 11; OMRSD V74 FILE III

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/05/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 1059 ABORT: 3/3

ITEM: NSP DATA RATE XMIT SWITCH  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, FAILS MID-TRAVEL,  
FAILS TO OPEN/CLOSE, PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL)

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM/NSP SYSTEM
- 3) NSP DATA RATE XMIT SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/2R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANE A1  
PART NUMBER: ME452-0102-7201

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

WITH THE S-BAND PM/NSP SYSTEM IN THE GCIL "PANEL" MODE, THIS SWITCH PERMITS PANEL SELECTION OF HI-DATA-RATE OR LO-DATA-RATE FOR SSO-GROUND OPNL TLM. IN "COMMAND", THE NORMAL OPERATIONAL MODE, SELECTION IS BY GCIL GROUND COMMAND OR BY ORBITER KEYBOARD. OPERATIONAL REDUNDANCY FOR PANEL MODE CONTROL OF XMIT DATA RATE FOR S-BAND PM IS BY GCIL COMMAND MODE. LOSS OF ALL CAPABILITY TO SELECT XMIT DATA RATE IS TANTAMOUNT TO LOSS OF S-BAND PM DL. CURRENT FLIGHT RULES REQUIRE MISSION TERMINATION (NEXT PLS LANDING) FOR LOSS OF ALL DL TELEMETRY/VOICE VIA S-BAND PM, WHICH LEAVES ONLY UHF FOR DL VOICE FOR LANDING OPERATIONS.

REFERENCES: SCHEMATIC VS70-740229. VS70-740299; SSSH 16.1, 16.3; INCO/COMM SYSTEMS BRIEF 3, 6, 27; FLIGHT RULES JSC-12820, SECTION 11

REPORT DATE 12/31/87 C-60

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 1060 ABORT: 3/3

ITEM: NSP DATA RATE XMIT SWITCH  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM/NSP SYSTEM
- 3) NSP DATA RATE XMIT SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7201

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

WITH S-BAND PM/NSP SYS IN GCIL "PNL" MODE, THIS SWITCH PERMITS PNL SELECTION OF ORBITER-TO-GND OPNL TLM HI-DATA-RATE OR LO-DATA-RATE. IN "CMD," THE NORMAL OPNL MODE, SELECTION IS BY GCIL GND CMD. A HARD SHORT OF BOTH POLES TO GND WOULD DISABLE NUMEROUS NSP PNL CONTROL FUNCTIONS USING PWR FROM FLCA2 (MNB) AND FLCA3 (MNC), AND WOULD ALSO KILL STATUS DISCRETES "DATA XMIT ON NSP 1" AND "DATA XMIT ON NSP 2" REQUIRED BY XPNDRS 1 AND 2 FOR DL IN PNL MODE. OPNL REDUNDANCY IS AVAILABLE IN CMD MODE. LOSS OF ALL OPNL REDUNDANCY FOR S-BAND PM (BOTH STRINGS, IN EFFECT) WOULD CAUSE MISSION TERMINATION (ONLY KU-BAND WOULD REMAIN FOR TELEMETRY FOR ON-ORBIT, AND ONLY UHF FOR SV UPDATES AND VOICE DURING DEORBIT AND LANDING OPS).

REFERENCES: SCHEMATIC VS70-740229. VS70-740299; SSSH 16.1, 16.3; INCO/COMM SYSTEMS BRIEF 3, 6, 27; FLIGHT RULES JSC-12820, SECTION 11

REPORT DATE 12/31/87

C-61

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 1061 ABORT: 3/1R

ITEM: NSP DATA RATE RCV SWITCH  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, FAILS MID-TRAVEL,  
FAILS TO OPEN/CLOSE, PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL)

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM/NSP SYSTEM
- 3) NSP DATA RATE XMIT SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7401

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

WITH THE S-BAND PM/NSP SYSTEM IN GCIL PNL MODE THIS SWITCH PERMITS PNL SECTION OF HI-DATA-RATE OR LO-DATA-RATE FOR OPERATIONAL UL/FL. IN CMD, THE NORMAL MODE, SELECTION IS BY GCIL GROUND CMD OR SSO KEYBOARD. FAILURE OPEN IN BOTH HI AND LO DATA RATE SWITCH PATHS (SWITCH JAMMED, CONTAMINATION, FAILS MID-TRAVEL) WOULD KILL S-BAND PM UL/FL LEAVING ONLY KU-BAND FL AND UHF UL FOR STATE VECTOR UPDATES AND VOICE ON-ORBIT, AND FLIGHT RULES WOULD REQUIRE FLIGHT TERMINATION. LOSS OF ALL REDUNDANCY INCLUDING UHF UPLINK VOICE FOR STATE VECTOR UPDATES AND LANDING OPERATIONS COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SCHEMATIC VS70-740229. VS70-740299; SSSH 16.1, 16.3; INCO/COMM SYSTEMS BRIEF 3, 6, 27; FLIGHT RULES JSC-12820, SECTION 11

REPORT DATE 12/31/87 C-62

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/04/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 1062 ABORT: 3/1R

ITEM: NSP DATA RATE RCV SWITCH  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM/NSP SYSTEM
- 3) NSP DATA RATE XMIT SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7401

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

IN GCIL PNL MODE, THIS SWITCH SELECTS UL/FL DATA RATE FOR SSO RCV. IN CMD MODE, SELECTION IS BY GCIL GND CMD OR BY KYBD. CMD MODE IS NORMAL OPNL MODE, WITH PNL MODE THE ALTERNATE. A HARD SHORT TO GND IN SWITCH WOULD KILL PWR FROM FLCA2 AND FLCA3, DISABLING NUMEROUS NSP CONFIGURATION PNL CONTROL SELECTOR CIRCUITS (E.G., UL DATA SOURCE, NSP DATA RATE XMIT AND RCV, NSP CODING XMIT AND RCV, NSP ENCRYPTION MODE). IT WOULD ALSO KILL "DATA XMIT ON NSP 1" AND "DATA XMIT ON NSP 2" SIGNALS REQUIRED BY XPNDRS 1 AND 2 FOR DL XMIT FOR PNL MODE. LOSS OF PATHS FOR VCE COMM & SV UPDATES VIA NSP CMD MODE AND UHF COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SCHEMATIC VS70-740229. VS70-740299; SSSH 16.1, 16.3; INCO/COMM SYSTEMS BRIEF 3, 6, 27; FLIGHT RULES JSC-12820, SECTION 11

REPORT DATE 12/31/87

C-63

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/10/87  
SUBSYSTEM: COMM & TRACK  
MDAC ID: 1063

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 3/3

ITEM: NSP CODING XMIT SWITCH  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, FAILS MID-TRAVEL,  
FAILS TO OPEN/CLOSE, PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL)

LEAD ANALYST: A.W. ADDIS

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM/NSP SYSTEM
- 3) NSP CODING XMIT SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANE A1  
PART NUMBER: ME452-0102-7201

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

WITH THE S-BAND PM/NSP SYSTEM IN GCIL "PNL" MODE THIS SWITCH PERMITS PNL ON-OFF CONTROL OF CONVOLUTIONAL CODING OF RL DATA (VIA TDRS). CODING REDUCES CHANNEL BIT ERROR RATES AND IMPROVES RF LINK PERFORMANCE. IN "CMD", THE NORMAL OPNL MODE, SELECTION IS BY GCIL GROUND CMD OR SSO KEYBOARD. CODING IS NOT USED FOR DIRECT DL TO GSTDN, BUT IS REQUIRED FOR RELAY VIA TDRS. LOSS OF SWITCH CONTROL (PNL MODE) WOULD REQUIRE USE OF THE OPERATIONALLY REDUNDANT "CMD" MODE FOR RL. LOSS OF THAT REDUNDANCY COULD CAUSE LOSS OF MISSION OBJECTIVES AND THUS MISSION TERMINATION BECAUSE OF CONFLICTING VEHICLE ATTITUDE CONSTRAINTS (CRITICAL EXPERIMENTS VERSUS COMM REQUIREMENTS).

REFERENCES: SCHEMATIC VS70-740229. VS70-740299; SSSH 16.1, 16.3; INCO/COMM SYSTEMS BRIEF 3, 6, 27; FLIGHT RULES JSC-12820, SECTION 11

REPORT DATE 12/31/87

C-64



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 1064 ABORT: 3/1R

ITEM: NSP CODING XMIT SWITCH  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM/NSP SYSTEM
- 3) NSP CODING XMIT SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7201

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

IN GCIL PNL MODE THIS SWITCH PERMITS PNL ON/OFF CONTROL OF CODING OF RL DATA. IN CMD, THE NORMAL MODE, SELECTION IS BY GCIL GND CMD OR SSO KYBD. CMD MODE IS NORMAL OPNL MODE, WITH PNL MODE THE ALTERNATE. A HARD SHORT TO GND IN SWITCH WOULD KILL PWR FROM FLCA2 AND FLCA3, DISABLING NUMEROUS NSP CONFIGURATION PNL CONTROL SELECTOR CIRCUITS (E.G., UL DATA SOURCE, NSP DATA RATE XMIT AND RCV, NSP CODING XMIT AND RCV, NSP ENCRYPTION). IT WOULD ALSO KILL "DATA XMIT ON NSP 1" AND "DATA XMIT ON NSP 2" SIGNALS REQUIRED BY XPNDRS 1 AND 2 FOR DL XMIT FOR PNL MODE. LOSS OF PATHS FOR VCE COMM & SV UPDATES VIA NSP AND VIA UHF COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SCHEMATIC VS70-740229. VS70-740299; SSSH 16.1, 16.3; INCO/COMM SYSTEMS BRIEF 3, 6, 27; FLIGHT RULES JSC-12820, SECTION 11

REPORT DATE 12/31/87

C-65

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 1065 ABORT: 3/3

ITEM: NSP CODING RCV SWITCH  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, FAILS MID-TRAVEL,  
FAILS TO OPEN/CLOSE, PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL)

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM/NSP SYSTEM
- 3) NSP CODING XMIT SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7201

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE: WITH THE S-BAND PM/NSP SYSTEM IN THE GCIL "PNL" MODE THIS SWITCH PERMITS PNL ON/OFF CONTROL OF DECODING OF FL DATA (VIA TDRS). CODING REDUCES CHANNEL BIT ERROR RATES AND IMPROVES RF LINK PERFORMANCE. CODING IS NOT USED FOR DIRECT UL FROM GSTDN, BUT IS NORMALLY REQUIRED FOR RELAY VIA TDRS. IN "CMD", THE NORMAL OPNL MODE, SELECTION IS BY GCIL GROUND CMD OR SSO KEYBOARD. LOSS OF SWITCH CONTROL (PNL MODE) WOULD REQUIRE USE OF THE OPERATIONALLY REDUNDANT CMD MODE FOR FL. LOSS OF THAT REDUNDANCY COULD CAUSE LOSS OF MISSION OBJECTIVES AND THUS MISSION TERMINATION BECAUSE OF CONFLICTING ATTITUDE CONSTRAINTS (CRITICAL EXPERIMENTS VERSUS COMM REQUIREMENTS).

REFERENCES: SCHEMATIC VS70-740229. VS70-740299; SSSH 16.1, 16.3; INCO/COMM SYSTEMS BRIEF 3, 6, 27; FLIGHT RULES JSC-12820, SECTION 11

REPORT DATE 12/31/87 C-66

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 1066 ABORT: 3/1R

ITEM: NSP CODING RCV SWITCH  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM/NSP SYSTEM
- 3) NSP CODING RCV SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7201

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

IN GCIL PNL MODE THIS SWITCH PERMITS PNL ON-OFF CONTROL OF DECODING OF FL DATA. IN CMD, THE NORMAL OPNL MODE, SELECTION IS BY GCIL GND CMD OR SSO KYBD. CMD MODE IS NORMAL OPNL MODE, WITH PNL MODE THE ALTERNATE. A HARD SHORT TO GND IN SWITCH WOULD KILL PWR FROM FLCA2 AND FLCA3, DISABLING NUMEROUS NSP CONFIGURATION PNL CONTROL SELECTOR CIRCUITS (E.G., UL DATA SOURCE, NSP DATA RATE XMIT AND RCV, NSP CODING XMIT AND RCV, NSP ENCRYPTION MODE). IT WOULD ALSO KILL "DATA XMIT ON NSP 1" AND "DATA XMIT ON NSP 2" SIGNALS REQUIRED BY XPNDRS 1 AND 2 FOR DL XMIT FOR PNL MODE. LOSS OF PATHS FOR VCE COMM & SV UPDATES VIA NSP AND VIA UHF COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SCHEMATIC VS70-740229. VS70-740299; SSSH 16.1, 16.3; INCO/COMM SYSTEMS BRIEF 3, 6, 27; FLIGHT RULES JSC-12820, SECTION 11

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 1067 ABORT: 3/1R

ITEM: UPLINK BLOCK SWITCH  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) UPLINK BLOCK SWITCH
- 3)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL C3  
PART NUMBER: ME452-0102-7262

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS THREE-POSITION SWITCH PERMITS BLOCKING OR ENABLING OF UL CMDS. "NSP BLK" INHIBITS ALL UL CMDS AT BOTH NSPS; "GPC BLK" INHIBITS ALL 2-STAGE (CRITICAL) CMDS; "ENABLE" SIMPLY REMOVES INHIBITS. IT INHIBITS UNAUTHORIZED OR UNDESIRE CMDS WHEN SSO IS NOT IN VALID RF UL COVERAGE ZONE, AND DURING CRITICAL PERIODS (E.G., PL OPS, EVA OPS, MANEUVERS). LOSS OF SWITCH CONTINUITY FOR EITHER BLOCK SIGNAL MAKES SSO VULNERABLE TO UNDESIRE CMDS. UNLIKE REDUNDANCY EXISTS FOR UL INHIBITS VIA DPS UTILITY DISPALY 001 USING CRT AND KYBD. LOSS OF ALL CAPABILITY TO INHIBIT SPURIOUS CMDS COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SCHEMATIC VS70-740229. VS70-740299; SSSH 16.1, 16.3; INCO/COMM SYSTEMS BRIEF 3, 6, 27; FLIGHT RULES JSC-12820, SECTION 11

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 2/1R  
MDAC ID: 1068 ABORT: 3/1R

ITEM: UPLINK BLOCK SWITCH  
FAILURE MODE: FAILS TO OPEN/CLOSE, PHYSICAL BINDING/JAMMING,  
FAILS TO SWITCH, SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) UPLINK BLOCK SWITCH
- 3)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL C3  
PART NUMBER: ME452-0102-7262

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS 3-POSITION SWITCH PERMITS BLOCKING OR ENABLING OF UL CMDS. "NSP BLK" INHIBITS ALL UL CMDS AT BOTH NSPS; "GPC BLK" INHIBITS ALL 2-STAGE CMDS; "ENABLE" SIMPLY REMOVES INHIBITS. IT INHIBITS UNAUTHORIZED OR UNDESIRE CMDS WHEN SSO IS NOT IN A VALID RF UL COVERAGE ZONE, AND DURING CRITICAL PERIODS (E.G., PL OPS, EVA OPS, MANEUVERS). BINDING IN EITHER BLOCK POSITION OR HARD BRIDGING SHORT IN EITHER PREVENTS RECEIPT/PROCESSING OF UL CMDS. UNLIKE REDUNDANCY NORMALLY AVAILABLE WITH DPS UTILITY DISPLAY 001 AND KYBD WOULD BE INOPERATIVE (EITHER INHIBIT FROM SWITCH OVERRIDES UL ENABLE AND UL AUTO VIA KYBD/CRT). ONLY UHF WOULD REMAIN FOR SV UPDATES. LOSS OF UHF COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SCHEMATIC VS70-740229. VS70-740299; SSSH 16.1, 16.3; INCO/COMM SYSTEMS BRIEF 3, 6, 27; FLIGHT RULES JSC-12820, SECTION 11

REPORT DATE 12/31/87

C-69

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/15/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 1069 ABORT: 3/1R

ITEM: NSP POWER SWITCH  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, FAILS MID-TRAVEL,  
FAILS TO OPEN/CLOSE, PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL)

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM/NSP SYSTEM
- 3) SIGNAL PROCESSING
- 4) NSP POWER SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	3/1R		AOA:	3/1R
DEORBIT:	3/1R		ATO:	3/1R
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7206

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS SWITCH (NSP1/OFF/NSP2) PERMITS PNL CONTROL OF POWER TO THE NSPS FROM FLCA2 AND FLCA3 WITH SYSTEM IN GCIL PNL MODE. OPNL REDUNDANCY FOR PWR CONTROL EXISTS WITH SYS IN GCIL CMD MODE, THE NORMAL OPNL MODE. FOR A SWITCH FAILURE CAUSING OPEN CIRCUITS IN BOTH DECKS (NO PNL CONTROL FOR EITHER NSP) GCIL CMD MODE WOULD BE SELECTED. LOSS OF THAT REDUNDANCY WOULD CAUSE MISSION TERM BECAUSE OF LOSS OF CMDS & TLM. ONLY UHF VOICE WOULD REMAIN FOR STATE VECTOR UPDATES AND FOR LANDING OPS SUPPORT. LOSS OF ALL CAPABILITY FOR SV UPDATES AND TWO-WAY VOICE FOR LANDING OPS COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SCHEMATIC VS70-740229. VS70-740299; SSSH 16.1, 16.3; INCO/COMM SYSTEMS BRIEF 3, 6, 27; FLIGHT RULES JSC-12820, SECTION 11

REPORT DATE 12/31/87

C-70

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/15/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 1070 ABORT: 3/1R

ITEM: NSP POWER SWITCH  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PM/NSP SYSTEM
- 3) SIGNAL PROCESSING
- 4) NSP POWER SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7206

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS SWITCH (NSP1/OFF/NSP2) PERMITS PANEL CONTROL (CNTRL BUSSES BC1 & BC2) OF POWER TO THE NSPS FROM FLCA2 AND FLCA3 WITH THE SYSTEM IN GCIL PNL MODE. OPNL REDUNDANCY EXISTS FOR PWR CONTROL WITH SYSTEM IN GCIL CMD MODE, THE NORMAL MODE. FOR A HARD SHORT IN THE SWITCH AFFECTING BOTH PNL CONTROL PATHS GCIL CMD MODE WOULD BE SELECTED. BUSSES BC1 & BC2 ARE PROTECTED IN PNL MODE BY CURRENT-LIMITING RESISTORS AND IN CMD MODE BY FUSES. LOSS OF CMD MODE CONTROL WOULD CAUSE MISSION TERMINATION BECAUSE OF LOSS OF CMDS & TLM. ONLY UHF VOICE WOULD REMAIN FOR STATE VECTOR UPDATES AND LANDING OPS SUPPORT. LOSS OF ALL CAPABILITY FOR SV UPDATES AND TWO-WAY VOICE FOR LANDING OPS COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SCHEMATIC VS70-740229. VS70-740299; SSSH 16.1, 16.3; INCO/COMM SYSTEMS BRIEF 3, 6, 27; FLIGHT RULES JSC-12820, SECTION 11

REPORT DATE 12/31/87

C-71

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1501 ABORT: 3/2R

ITEM: FUSE, 1A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PM AMPLIFIER SYSTEM
- 2) CNTLBC1 BUS
- 3) 1A FUSE F7
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CIRCUIT SHORT, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF COMMAND POWER TO GCIL CKTS CONTROLLING S-BAND POWER  
AMPLIFIER 1 (PA1) STANDBY/OPERATE SIGNALS. PARTIAL REDUNDANCY  
FOR THESE COMMANDS PROVIDED BY PNL SWITCHES. REDUNDANCY FOR  
GROUND COMMAND FUNCTION PROVIDES FOR CONTROL OF PA2  
STANDBY/OPERATE SIGNALS. LOSS OF ALL REDUNDANCY DISABLES PA AND  
PREAMP OPERATION AND ALLOWS ONLY STDN IQ CONFIG OF S-BAND  
COMMUNICATIONS. UHF OPERATES AS BACKUP DURING MISSION. HOWEVER,  
LOSS OF ALL S-BAND REDUNDANCY RESULTS IN LOSS OF MISSION.

REFERENCES: SSSH 16.2, SYST SCHEM VS70-740139

REPORT DATE 12/31/87

C-72



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1502 ABORT: 3/2R

ITEM: FUSE, 1A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PM AMPLIFIER SYSTEM
- 2) CNTLBC2 BUS
- 3) 1A FUSE F14
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF COMMAND POWER TO GCIL CKTS CONTROLLING S-BAND POWER  
AMPLIFIER 2(PA2) STANDBY/OPERATE SIGNALS. PARTIAL REDUNDANCY FOR  
THESE COMMANDS PROVIDED BY PNL SWITCHES. REDUNDANT TO GROUND  
COMMAND FUNCTION FOR CONTROL OF PA1 STANDBY/OPERATE SIGNALS.  
LOSS OF ALL REDUNDANCY DISABLES PA AND PREAMP OPERATION AND  
ALLOWS ONLY STDN LO CONFIG OF S-BAND COMMUNICATIONS. UHF  
OPERATES AS BACKUP DURING MISSION. HOWEVER, LOSS OF ALL S-BAND  
REDUNDANCY RESULTS IN LOSS OF MISSION.

REFERENCES: SSSH 16.2, SYST SCHEM VS70-740139

REPORT DATE 12/31/87

C-73

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1503 ABORT: 3/2R

ITEM: RESISTOR, 1.2K  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PM AMPLIFIER SYSTEM
- 2) CNTLBC1 BUS
- 3) 1.2K RESISTOR A15R3
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF PNL SWITCH CONTROL OF S-BAND POWER AMPLIFIER 1 (PA1)  
STANDBY/OPERATE SIGNALS. GCIL CONTROL IS RETAINED. REDUNDANCY  
FOR PNL SWITCH CONTROL IS PROVIDED FOR PA2 STANDBY/OPERATE  
SIGNALS. LOSS OF ALL REDUNDANCY DISABLES PA AND PREAMP OPERATION  
AND ALLOWS ONLY STDN LO CONFIG OF S-BAND COMMUNICATIONS. UHF  
OPERATES AS BACKUP DURING MISSION. HOWEVER, LOSS OF ALL S-BAND  
REDUNDANCY RESULTS IN LOSS OF MISSION.

REFERENCES: SSSH 16.2, SYST SCHEM VS70-740139

REPORT DATE 12/31/87

C-74

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1504 ABORT: 3/2R

ITEM: RESISTOR, 1.2K  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PM AMPLIFIER SYSTEM
- 2) CNTLBC2 BUS
- 3) 1.2K RESISTOR A15R4
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF PNL SWITCH CONTROL OF S-BAND POWER AMPLIFIER 2 (PA2)  
STANDBY/OPERATE SIGNALS. GCIL CONTROL IS RETAINED. REDUNDANT TO  
PNL SWITCH CONTROL FOR PA1 STANDBY/OPERATE SIGNALS. LOSS OF ALL  
REDUNDANCY DISABLES PA AND PREAMP OPERATION AND ALLOWS ONLY  
STDN LO CONFIG OF S-BAND COMMUNICATIONS. UHF OPERATES AS BACKUP  
DURING MISSION. HOWEVER, LOSS OF ALL S-BAND REDUNDANCY RESULTS  
IN LOSS OF MISSION.

REFERENCES: SSSH 16.2, SYST SCHEM VS70-740139

REPORT DATE 12/31/87

C-75

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/28/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1505 ABORT: 3/2R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PM AMPLIFIER SYSTEM
- 2) CNTLBC1 BUS
- 3) 1.2K RESISTOR
- 4) PNL SWITCH 11, 12
- 5) DIODE A18CR15
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF PNL SWITCH CONTROL OF S-BAND POWER AMPLIFIER 1  
STANDBY/OPERATE SIGNALS. LOSS OF CMD POWER TO GCIL CKT  
CONTROLLING PA1 ON. REDUNDANCY PROVIDED FOR PNL SWITCH/GCIL  
CONTROL OF PA2 STANDBY/OPERATE SIGNALS. LOSS OF ALL REDUNDANCY  
DISABLES PA AND PREAMP OPERATION AND ALLOWS ONLY STDN LO CONFIG  
OF S-BAND COMM. UHF OPERATES AS BACKUP DURING MISSION. HOWEVER,  
LOSS OF ALL S-BAND REDUNDANCY RESULTS IN LOSS OF MISSION.

REFERENCES: SSSH 16.2, SYST SCHEM VS70-740139

REPORT DATE 12/31/87

C-76

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/28/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1506 ABORT: 3/2R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PM AMPLIFIER SYSTEM
- 2) CNTLBC2 BUS
- 3) 1.2K RESISTOR
- 4) PNL SWITCH 11, 12
- 5) DIODE A18CR16
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	33/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF PNL SWITCH CONTROL OF S-BAND POWER AMPLIFIER 2  
STANDBY/OPERATE SIGNALS. LOSS OF CMD POWER TO GCIL CKT  
CONTROLLING PA2 ON. LOSS OF ALL REDUNDANCY DISABLES PA AND  
PREAMP OPERATION AND ALLOWS ONLY STDN LO CONFIG OF S-BAND COMM.  
UHF OPERATES AS BACKUP DURING MISSION. HOWEVER, LOSS OF ALL S-  
BAND REDUNDANCY RESULTS IN LOSS OF MISSION.

REFERENCES: SSSH 16.2, SYST SCHEM VS70-740139

REPORT DATE 12/31/87

C-77

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/28/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1507 ABORT: 3/2R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PM AMPLIFIER SYSTEM
- 2) PWR AMP OPERATE SWITCH 12
- 3) DIODE A18CR13
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF PNL SWITCH CONTROL OF S-BAND POWER AMPLIFIER 1 OPERATE  
CMD AND SIGNAL TO PREAMP ASSY. GCIL CONTROL REMAINS. ADDITIONAL  
REDUNDANCY PROVIDED FOR PNL SWITCH/GCIL CONTROL OF PA2. LOSS OF  
ALL REDUNDANCY DISABLES PA AND PREAMP OPERATION AND ALLOWS  
ONLY STDN LO CONFIG OF S-BAND COMM. UHF OPERATES AS BACKUP  
DURING MISSION. HOWEVER, LOSS OF ALL S-BAND REDUNDANCY RESULTS  
IN LOSS OF MISSION.

REFERENCES: SSSH 16.2, SYST SCHEM VS70-740139

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/28/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1508 ABORT: 3/2R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PM AMPLIFIER SYSTEM
- 2) PWR AMP OPERATE SWITCH 12
- 3) DIODE A18CR14
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF PNL SWITCH CONTROL OF S-BAND POWER AMPLIFIER 2 OPERATE  
CMD AND SIGNAL TO PREAMP ASSY. GCIL CONTROL REMAINS. LOSS OF ALL  
REDUNDANCY DISABLES PA AND PREAMP OPERATION AND ALLOWS ONLY STDN  
LO CONFIG OF S-BAND COMM. UHF OPERATES AS BACKUP DURING  
MISSION. HOWEVER, LOSS OF ALL S-BAND REDUNDANCY RESULTS IN LOSS  
OF MISSION.

REFERENCES: SSSH 16.2, SYST SCHEM VS70-740139

REPORT DATE 12/31/87

C-79

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/28/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1509 ABORT: 3/2R

ITEM: FUSE, 1A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PM AMPLIFIER SYSTEM
- 2) CNTLBC1 BUS
- 3) 1A FUSE F6
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF GCIL COMMAND POWER CONTROLLING APPLICATION OF 28VDC POWER  
TO S-BAND PREAMP 1 AND HEATER. REDUNDANCY PROVIDED BY PANEL  
SWITCH CONTROL. ADDITIONAL REDUNDANCY PROVIDED BY PNL  
SWITCH/GCIL CONTROL OF PREAMP 2. LOSS OF ALL REDUNDANCY DISABLES  
PREAMP OPERATIONS AND ALLOWS ONLY STDN LO CONFIG OF S-BAND COMM.  
UHF OPERATES AS BACKUP DURING MISSION. HOWEVER, LOSS OF ALL S-  
BAND REDUNDANCY RESULTS IN LOSS OF MISSION.

REFERENCES: SSSH 16.2, SYST SCHEM VS70-740139



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/28/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1510 ABORT: 3/2R

ITEM: FUSE, 1A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PM AMPLIFIER SYSTEM
- 2) CNTLBC1 BUS
- 3) 1A FUSE F13
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CIRCUIT SHORT, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF GCIL COMMAND POWER CONTROLLING APPLICATION OF 28VDC POWER  
TO S-BAND PREAMP 2 AND HEATER. REDUNDANCY PROVIDED BY PANEL  
SWITCH CONTROL. LOSS OF ALL REDUNDANCY DISABLES PREAMP  
OPERATIONS AND ALLOWS ONLY STDN LO CONFIG OF S-BAND COMM.  
UHF OPERATES AS BACKUP DURING MISSION. HOWEVER, LOSS OF ALL S-  
BAND REDUNDANCY RESULTS IN LOSS OF MISSION.

REFERENCES: SSSH 16.2, SYST SCHEM VS70-740139

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/28/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1511 ABORT: 3/2R

ITEM: RESISTOR, 1.2K  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PM AMPLIFIER SYSTEM
- 2) CNTLBC1 BUS
- 3) 1.2K RESISTOR A15R1
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	3/2R		AOA:	3/3
DEORBIT:	3/3		ATO:	3/2R
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF PNL SWITCH POWER CONTROLLING APPLICATION OF 28VDC POWER TO S-BAND PREAMP 1 AND HEATER. REDUNDANCY PROVIDED BY GCIL CONTROL. ADDITIONAL REDUNDANCY PROVIDED BY PNL SWITCH/GCIL CONTROL OF PREAMP 2. LOSS OF ALL REDUNDANCY DISABLES PREAMP OPERATIONS AND ALLOWS ONLY STDN LO CONFIG OF S-BAND COMM. UHF OPERATES AS BACKUP DURING MISSION. HOWEVER, LOSS OF ALL S-BAND REDUNDANCY RESULTS IN LOSS OF MISSION.

REFERENCES: SSSH 16.2, SYST SCHEM VS70-740139

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/28/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1512 ABORT: 3/2R

ITEM: RESISTOR, 1.2K  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PM AMPLIFIER SYSTEM
- 2) CNTLBC1 BUS
- 3) 1.2K RESISTOR A15R2
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF PNL SWITCH POWER CONTROLLING APPLICATION OF 28VDC POWER  
TO S-BAND PREAMP 2 AND HEATER. REDUNDANCY PROVIDED BY GCIL  
CONTROL. LOSS OF ALL REDUNDANCY DISABLES PREAMP OPERATIONS AND  
ALLOWS ONLY STDN LO CONFIG OF S-BAND COMM. UHF OPERATES AS  
BACKUP DURING MISSION. HOWEVER, LOSS OF ALL S-BAND REDUNDANCY  
RESULTS IN LOSS OF MISSION.

REFERENCES: SSSH 16.2, SYST SCHEM VS70-740139

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/28/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1513 ABORT: 3/2R

ITEM: FUSE, 10A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PM AMPLIFIER SYSTEM
- 2) FLC2 BUS
- 3) 10A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION:  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:  
LOSS OF 28VDC TO S-BAND PREAMP 1 HEATER. REDUNDANCY PROVIDED BY  
PARALLEL POWER SUPPLY TO PREAMP 2 HEATER. LOSS OF ALL REDUNDANCY  
MAY DEGRADE/DISABLE PREAMP OPERATION AND CAUSE LOSS OF MISSION.

REFERENCES: SSSH 16.2, SYST SCHEM VS70-740139

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/28/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1514 ABORT: 3/2R

ITEM: FUSE, 10A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PM AMPLIFIER SYSTEM
- 2) FLC3 BUS
- 3) 10A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC TO S-BAND PREAMP 2 HEATER. LOSS OF ALL REDUNDANCY  
MAY DEGRADE/DISABLE PREAMP OPERATION AND CAUSE LOSS OF MISSION.

REFERENCES: SSSH 16.2, SYST SCHEM VS70-740139

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/28/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1515 ABORT: 3/2R

ITEM: FUSE, 10A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PM AMPLIFIER SYSTEM
- 2) FLC2 BUS
- 3) 10A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION:  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC TO S-BAND PREAMP 1. REDUNDANCY PROVIDED BY  
PARALLEL POWER SUPPLY TO PREAMP 2. LOSS OF ALL REDUNDANCY  
DISABLES PREAMP OPERATION AND CAUSES LOSS OF MISSION.

REFERENCES: SSSH 16.2, SYST SCHEM VS70-740139

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/28/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1516 ABORT: 3/2R

ITEM: FUSE, 10A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PM AMPLIFIER SYSTEM
- 2) FLC3 BUS
- 3) 10A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	3/2R		AOA:	3/3
DEORBIT:	3/3		ATO:	3/2R
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC TO S-BAND PREAMP 2. LOSS OF ALL REDUNDANCY  
DISABLES PREAMP OPERATION AND CAUSES LOSS OF MISSION.

REFERENCES: SSSH 16.2, SYST SCHEM VS70-740139

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/28/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1517 ABORT: 3/2R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PM AMPLIFIER SYSTEM
- 2) CNTLBC1 BUS
- 3) 1.2K RESISTOR
- 4) S-BAND PREAMP 1/2 SWITCH S10
- 5) DIODE A18CR11
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF PNL SWITCH POWER CONTROLLING APPLICATION OF 28VDC POWER TO S-BAND PREAMP 1 AND HEATER. REDUNDANCY PROVIDED BY GCIL CONTROL. ADDITIONAL REDUNDANCY PROVIDED BY PNL SWITCH/GCIL CONTROL OF PREAMP 2. LOSS OF ALL REDUNDANCY DISABLES PREAMP OPERATIONS AND ALLOWS ONLY STDN LO CONFIG OF S-BAND COMM. UHF OPERATES AS BACKUP DURING MISSION. HOWEVER, LOSS OF ALL S-BAND REDUNDANCY RESULTS IN LOSS OF MISSION.

REFERENCES: SSSH 16.2, SYST SCHEM VS70-740139

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/28/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1518 ABORT: 3/2R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PM AMPLIFIER SYSTEM
- 2) CNTLBC2 BUS
- 3) 1.2K RESISTOR
- 4) S-BAND PREAMP 1/2 SWITCH S10
- 5) DIODE A18CR12
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF PNL SWITCH POWER CONTROLLING APPLICATION OF 28VDC POWER  
TO S-BAND PREAMP 2 AND HEATER. REDUNDANCY PROVIDED BY GCIL  
CONTROL. LOSS OF ALL REDUNDANCY DISABLES PREAMP OPERATIONS AND  
ALLOWS ONLY STDN LO CONFIG OF S-BAND COMM. UHF OPERATES AS  
BACKUP DURING MISSION. HOWEVER, LOSS OF ALL S-BAND REDUNDANCY  
RESULTS IN LOSS OF MISSION.

REFERENCES: SSSH 16.2, SYST SCHEM VS70-740139

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/05/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/1R  
MDAC ID: 1519 ABORT: 3/1R

ITEM: SWITCH, 4-POLE, 3-POS, S16  
FAILURE MODE: FAILS OPEN, FAILS TO TRANSFER

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM TRANSPONDER PANEL MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) SWITCH, 4-POLE, 3-POS, S16
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 36V73A1A2S16  
PART NUMBER: ME452-0102-7403

CAUSES: MISHANDLING, MECHANICAL/STRUCTURAL MALFUNCTION,  
SHOCK/VIBRATION, CONTAMINATION/CORROSION/DETERIORATION,  
TEMPERATURE LIMITS EXCEEDED.

EFFECTS/RATIONALE:

SWITCH S16 ON PANEL A1A2 PERMITS SELECTION OF EITHER S-BAND PM  
TRANSPONDER WHEN THE GCIL IS IN THE PANEL MODE.  
THREE ADDITIONAL FAILURES - LOSS OF COMMAND MODE CONTROL OF  
TRANSPONDER 1, LOSS OF THE REDUNDANT S-BAND PM TRANSPONDER, AND  
UHF VOICE - COULD PREVENT STATE VECTOR UPDATES AND RESULT IN LOSS  
OF CREW/VEHICLE.

REFERENCES: VS70-740129, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/05/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/1R  
MDAC ID: 1520 ABORT: 3/1R

ITEM: SWITCH, 4-POLE, 3-POS, S16  
FAILURE MODE: FAILS SHORTED-TO-GROUND

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM TRANSPONDER PANEL MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) SWITCH, 4-POLE, 3-POS, S16
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 36V73A1A2S16  
PART NUMBER: ME452-0102-7403

CAUSES: MISHANDLING, MECHANICAL/STRUCTURAL MALFUNCTION,  
SHOCK/VIBRATION, CONTAMINATION/CORROSION/DETERIORATION,  
TEMPERATURE LIMITS EXCEEDED.

EFFECTS/RATIONALE:

SWITCH S16 ON PANEL A1A2 PERMITS SELECTION OF EITHER S-BAND PM  
TRANSPONDER WHEN THE GCIL IS IN THE PANEL MODE.  
THREE ADDITIONAL FAILURES - LOSS OF COMMAND MODE CONTROL OF  
TRANSPONDER 1, LOSS OF THE REDUNDANT S-BAND PM TRANSPONDER, AND  
UHF VOICE - COULD PREVENT STATE VECTOR UPDATES AND RESULT IN LOSS  
OF CREW/VEHICLE.

REFERENCES: VS70-740129, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/1R  
MDAC ID: 1521 ABORT: 3/1R

ITEM: DIODE, A16CR1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM TRANSPONDER PANEL MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) DIODE, A16CR1
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 3 ] B [ F ] C [ P ]

LOCATION: 36V73A1A2A16CR1  
PART NUMBER: JANTXV1N4246

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

DIODE CR1 PROVIDES PROTECTION FOR THE GCIL DRIVER AGAINST REVERSE  
CURRENT LEAKAGE FROM THE GCIL DRIVER IN CASE OF A SHORT TO GROUND  
ON THE LOAD SIDE OF ASSOCIATED SWITCH S16.

FAILURE OPEN OF CR1 WOULD PREVENT POWERING UP TRANSPONDER NO. 1  
IN PANEL MODE. OPERATIONAL REDUNDANCY EXISTS IN GCIL COMMAND  
MODE. LOSS OF ALL CAPABILITY TO CONTROL POWER-UP FOR BOTH  
TRANSPONDERS IN EITHER PANEL OR COMMAND MODE PLUS LOSS OF UHF  
VOICE WOULD CAUSE LOSS OF CAPABILITY FOR STATE VECTOR UPDATES AND  
COULD RESULT IN LOSS OF CREW/VEHICLE.

REFERENCES: VS70-740129, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87  
SUBSYSTEM: C&T/EPD&C/S-BAND  
MDAC ID: 1522

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: DIODE, A16CR2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM TRANSPONDER PANEL MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) DIODE, A16CR2
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES	
FLIGHT PHASE	HDW/FUNC	ABORT
PRELAUNCH:	3/3	RTLS: 3/3
LIFTOFF:	3/3	TAL: 3/3
ONORBIT:	3/1R	AOA: 3/1R
DEORBIT:	3/1R	ATO: 3/1R
LANDING/SAFING:	3/3	

REDUNDANCY SCREENS: A [ 3 ] B [ F ] C [ P ]

LOCATION: 36V73A1A2A16CR2  
PART NUMBER: JANTXV1N4246

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

DIODE CR2 PROVIDES PROTECTION FOR THE GCIL DRIVER AGAINST REVERSE CURRENT LEAKAGE FROM THE GCIL DRIVER IN CASE OF A SHORT TO GROUND ON THE LOAD SIDE OF ASSOCIATED SWITCH S16.  
FAILURE OPEN OF CR2 WOULD PREVENT POWERING UP TRANSPONDER NO. 2 IN PANEL MODE. OPERATIONAL REDUNDANCY EXISTS IN GCIL COMMAND MODE. LOSS OF ALL CAPABILITY TO CONTROL POWER-UP FOR BOTH TRANSPONDERS IN EITHER PANEL OR COMMAND MODE PLUS LOSS OF UHF VOICE WOULD CAUSE LOSS OF CAPABILITY FOR STATE VECTOR UPDATES AND COULD RESULT IN LOSS OF CREW/VEHICLE.

REFERENCES: VS70-740129, SPACE SHUTTLE SYSTEMS HANDBOOK

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87  
SUBSYSTEM: C&T/EPD&C/S-BAND  
MDAC ID: 1523

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: DIODE, A16CR1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: W.W. ROBINSON

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM TRANSPONDER NO. 1 PANEL MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) DIODE, A16CR1
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A1A2A16CR1  
PART NUMBER: JANTXV1N4246

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

DIODE CR1 PROVIDES PROTECTION FOR THE ASSOCIATED GCIL DRIVER  
AGAINST REVERSE CURRENT LEAKAGE FROM THE DRIVER IN CASE OF A  
SHORT TO GROUND ON THE LOAD SIDE OF ASSOCIATED SWITCH S16. SHORT  
CIRCUIT FAILURE OF CR1 WOULD HAVE NO EFFECT ON MISSION  
OR CREW/VEHICLE.

REFERENCES: VS70-740129, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87  
SUBSYSTEM: C&T/EPD&C/S-BAND  
MDAC ID: 1524

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: DIODE, A16CR2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: W.W. ROBINSON

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM TRANSPONDER NO. 2 PANEL MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) DIODE, A16CR2
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A1A2A16CR2  
PART NUMBER: JANTXV1N4246

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

DIODE CR2 PROVIDES PROTECTION FOR THE ASSOCIATED GCIL DRIVER  
AGAINST REVERSE CURRENT LEAKAGE FROM THE DRIVER IN CASE OF A  
SHORT TO GROUND ON THE LOAD SIDE OF ASSOCIATED SWITCH S16. SHORT  
CIRCUIT FAILURE OF CR2 WOULD HAVE NO EFFECT ON MISSION  
OR CREW/VEHICLE.

REFERENCES: VS70-740129, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/1R  
MDAC ID: 1525 ABORT: 3/1R

ITEM: FUSE, 1AMP, A2F8  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM TRANSPONDER NO. 1 COMMAND MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) FUSE, 1 AMP, A2F8
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 36V73A1A2F8  
PART NUMBER: ME451-0018-0100

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

FUSE F8 PROVIDES OVERCURRENT PROTECTION TO THE GCIL "COMMAND"  
DRIVER CONTROL CIRCUIT OF THE ASSOCIATED S-BAND PM TRANSPONDER  
POWER CIRCUIT. WITH FUSE F8 FAILED OPEN POWER CANNOT BE PROVIDED  
TO ONE OF THE S-BAND PM TRANSPONDERS BY SOFTWARE COMMAND OR  
KEYBOARD. SUBSEQUENT LOSS OF THE REDUNDANT S-BAND PM TRANSPONDER  
AND UHF WOULD CAUSE LOSS OF STATE VECTOR UPDATE CAPABILITY  
WHICH COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: VS70-740129, SPACE SHUTTLE SYSTEMS HANDBOOK



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/1R  
MDAC ID: 1526 ABORT: 3/1R

ITEM: FUSE, 1AMP, A2F15  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM TRANSPONDER COMMAND MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) FUSE, 1 AMP, A2F15
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: 36V73A1A2F15  
PART NUMBER: ME451-0018-0100

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

FUSE F15 PROVIDES OVERCURRENT PROTECTION TO THE GCIL "COMMAND" DRIVER CONTROL CIRCUIT OF THE ASSOCIATED S-BAND PM TRANSPONDER POWER CIRCUIT. WITH FUSE F15 FAILED OPEN POWER CANNOT BE PROVIDED TO ONE OF THE S-BAND PM TRANSPONDERS BY SOFTWARE COMMAND OR KEYBOARD. SUBSEQUENT LOSS OF THE REDUNDANT S-BAND PM TRANSPONDER AND UHF WOULD CAUSE LOSS OF STATE VECTOR UPDATE CAPABILITY WHICH COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: VS70-740129, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/1R  
MDAC ID: 1527 ABORT: 3/1R

ITEM: HYBRID DRIVER, TYPE I, A17(J4-45)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM TRANSPONDER MODE SWITCH BUFFER
- 4) FORWARD AVIONICS BAY 2
- 5) HYBRID DRIVER, TYPE I, A17(J4-45)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 82V76A17(J4-45)  
PART NUMBER: MC477-0261-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS HYBRID DRIVER IS A BUFFER THAT PROVIDES POWER TO THE S-BAND PM TRANSPONDER MODE SWITCH AND THE NSP DATA RATE RECEIVE SWITCH FROM THE TRANSPONDER NO. 1 POWER CIRCUIT. LOSS OF OUTPUT OF THIS HYBRID DRIVER RESULTS IN LOSS OF POWER TO THE TRANSPONDER MODE SWITCH AND NSP DATA RATE RECEIVE SWITCH FOR 1 OF THE REDUNDANT S-BAND TRANSPONDERS.

A SUBSEQUENT COMBINATION OF S-BAND PM/NSP AND UHF VOICE SYSTEMS FAILURES COULD RESULT IN LOSS OF STATE VECTOR UPDATE CAPABILITY WHICH COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: VS70-740129, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/1R  
MDAC ID: 1528 ABORT: 3/1R

ITEM: HYBRID DRIVER, TYPE I, A18(J4-45)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM TRANSPONDER MODE SWITCH BUFFER
- 4) FORWARD AVIONICS BAY 3A
- 5) HYBRID DRIVER, TYPE I, A18(J4-45)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 83V76A18(J4-45)  
PART NUMBER: MC477-0261-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS HYBRID DRIVER IS A BUFFER THAT PROVIDES POWER TO THE S-BAND PM TRANSPONDER MODE SWITCH AND THE NSP DATA RATE RECEIVE SWITCH FROM THE TRANSPONDER NO. 2 POWER CIRCUIT. LOSS OF OUTPUT OF THIS HYBRID DRIVER RESULTS IN LOSS OF POWER TO THE TRANSPONDER MODE SWITCH AND NSP DATA RATE RECEIVE SWITCH FOR 1 OF THE REDUNDANT S-BAND TRANSPONDERS.

A SUBSEQUENT COMBINATION OF S-BAND PM/NSP AND UHF VOICE SYSTEMS FAILURES COULD RESULT IN LOSS OF STATE VECTOR UPDATE CAPABILITY WHICH COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: VS70-740129, SPACE SHUTTLE SYSTEMS HANDBOOK

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 1529 ABORT: 3/3

ITEM: HYBRID DRIVER, TYPE I, A17(J4-45)  
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM TRANSPONDER MODE SWITCH BUFFER
- 4) FORWARD AVIONICS BAY 2
- 5) HYBRID DRIVER, TYPE I, A17(J4-45)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 82V76A17(J4-45)  
PART NUMBER: MC477-0261-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS HYBRID DRIVER IS A BUFFER THAT PROVIDES POWER TO THE S-BAND  
PM TRANSPONDER MODE SWITCH AND THE NSP DATA RATE RECEIVE SWITCHES  
FROM THE TRANSPONDER NO.1 POWER CIRCUIT FOR PANEL MODE.  
INADVERTENT APPLICATION OF VOLTAGE TO THE S-BAND TRANSPONDER MODE  
SWITCH AND NSP DATA RATE RECEIVE SWITCH WOULD CAUSE LOSS OF PANEL  
SIGNAL STRENGTH METER INDICATION.  
THIS FAILURE WOULD NOT ENDANGER MISSION OR CREW/VEHICLE.

REFERENCES: VS70-740129, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 1530 ABORT: 3/3

ITEM: HYBRID DRIVER, TYPE I, A18(J4-45)  
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM TRANSPONDER MODE SWITCH BUFFER
- 4) FORWARD AVIONICS BAY 3A
- 5) HYBRID DRIVER, TYPE I, A18(J4-45)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 82V76A17(J4-45)  
PART NUMBER: MC477-0261-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS HYBRID DRIVER IS A BUFFER THAT PROVIDES POWER TO THE S-BAND  
TRANSPONDER MODE SWITCH AND THE NSP DATA RATE RECEIVE SWITCHES  
FROM THE TRANSPONDER NO.2 POWER CIRCUIT FOR PANEL MODE.  
INADVERTENT APPLICATION OF VOLTAGE TO THE S-BAND TRANSPONDER MODE  
SWITCH AND NSP DATA RATE RECEIVE SWITCH WOULD CAUSE LOSS OF PANEL  
SIGNAL STRENGTH METER INDICATION.  
THIS FAILURE WOULD NOT ENDANGER MISSION OR CREW/VEHICLE.

REFERENCES: VS70-740129, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/1R  
MDAC ID: 1531 ABORT: 3/1R

ITEM: RESISTOR, 1.2K OHM, 2W, A14R3  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM TRANSPONDER PANEL MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) RESISTOR, 1.2K OHM, 2W, A14R3
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: 36V73A1A2A14R3  
PART NUMBER: RWR80S1211BR

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

CURRENT LIMITING RESISTOR R3 PROTECTS THE S-BAND TRANSPONDER  
POWER CONTROL CIRCUIT FROM CURRENT OVERLOADS WHEN THE GCIL IS IN  
THE PANEL MODE.

RESISTOR R3 FAIL OPEN RESULTS IN LOSS OF ABILITY TO POWER UP THE  
ASSOCIATED REDUNDANT TRANSPONDER WHEN THE GCIL IS IN THE PANEL  
MODE. SUBSEQUENT FAILURE OF RESISTOR R4 (IOA 1514) WOULD CAUSE  
LOSS OF BOTH TRANSPONDERS IN THE PANEL MODE. LOSS OF  
OPERATIONALLY REDUNDANT GCIL COMMAND MODE FOR BOTH S-BAND PM/NSP  
STRINGS PLUS FAILURE OF UHF VOICE COULD CAUSE LOSS OF STATE  
VECTOR UPDATE CAPABILITY WHICH COULD RESULT IN LOSS OF  
CREW/VEHICLE.

REFERENCES: VS70-740129, SPACE SHUTTLE SYSTEMS HANDBOOK

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/1R  
MDAC ID: 1532 ABORT: 3/1R

ITEM: RESISTOR, 1.2K OHM, 2W, A14R4  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM TRANSPONDER PANEL MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) RESISTOR, 1.2K OHM, 2W, A14R4
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 36V73A1A2A14R4  
PART NUMBER: RWR80S1211BR

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

CURRENT LIMITING RESISTOR R4 PROTECTS THE S-BAND TRANSPONDER  
POWER CONTROL CIRCUIT FROM CURRENT OVERLOADS WHEN THE GCIL IS IN  
THE PANEL MODE.

RESISTOR R4 FAIL OPEN RESULTS IN LOSS OF ABILITY TO POWER UP THE  
ASSOCIATED REDUNDANT TRANSPONDER WHEN THE GCIL IS IN THE PANEL  
MODE. SUBSEQUENT FAILURE OF RESISTOR R3 (IOA 1531) WOULD CAUSE  
LOSS OF BOTH TRANSPONDERS IN THE PANEL MODE. LOSS OF  
OPERATIONALLY REDUNDANT GCIL COMMAND MODE FOR BOTH S-BAND PM/NSP  
STRINGS PLUS FAILURES OF S-BAND PM/NSP AND UHF VOICE SYSTEMS  
COULD CAUSE LOSS OF STATE VECTOR UPDATE CAPABILITY WHICH COULD  
POSSIBLY RESULT IN LOSS OF CREW/VEHICLE.

REFERENCES: VS70-740129, SPACE SHUTTLE SYSTEMS HANDBOOK

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/1R  
MDAC ID: 1533 ABORT: 3/1R

ITEM: HYBRID DRIVER, TYPE III, A17(J5-Z)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM TRANSPONDER POWER CONTROL CIRCUIT
- 4) LOAD CONTROL ASSY (LCA) 2
- 5) HYBRID DRIVER, TYPE III, A17(J5-Z)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES	
FLIGHT PHASE	HDW/FUNC	ABORT
PRELAUNCH:	3/3	RTLS: 3/3
LIFTOFF:	3/3	TAL: 3/3
ONORBIT:	3/1R	AOA: 3/1R
DEORBIT:	3/1R	ATO: 3/1R
LANDING/SAFING:	3/3	

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: 82V76A17J5Z  
PART NUMBER: MC477-0263-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS HYBRID DRIVER AND A REDUNDANT HYBRID DRIVER IN LCA 3 (IOA 1229) INDEPENDENTLY CONTROL POWER TO THEIR RESPECTIVE REDUNDANT TRANSPONDERS.

LOSS OF OUTPUT OF 1 HYBRID DRIVER CAUSES LOSS OF THE ABILITY TO POWER UP ONE OF THE TWO REDUNDANT TRANSPONDERS. SUBSEQUENT FAILURE OF THE SECOND HYBRID DRIVER RESULTS IN LOSS OF S-BAND CAPABILITY TO UPDATE STATE VECTORS.

SUBSEQUENT LOSS OF UHF CAPABILITY WOULD CAUSE LOSS OF ABILITY TO UPDATE STATE VECTORS WHICH COULD RESULT IN LOSS OF CREW/VEHICLE.

REFERENCES: VS70-740129, SPACE SHUTTLE SYSTEMS HANDBOOK



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/1R  
MDAC ID: 1534 ABORT: 3/1R

ITEM: HYBRID DRIVER, TYPE III, A18(J5-P)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM TRANSPONDER POWER CONTROL CIRCUIT
- 4) LOAD CONTROL ASSY (LCA) 3
- 5) HYBRID DRIVER, TYPE III, A18(J5-P)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: 82V76A18J5P  
PART NUMBER: MC477-0263-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS HYBRID DRIVER AND A REDUNDANT HYBRID DRIVER IN LCA 2 (IOA 1228) INDEPENDENTLY CONTROL POWER TO THEIR RESPECTIVE REDUNDANT TRANSPONDERS.

LOSS OF OUTPUT OF 1 HYBRID DRIVER CAUSES LOSS OF THE ABILITY TO POWER UP ONE OF THE TWO REDUNDANT TRANSPONDERS. SUBSEQUENT FAILURE OF THE SECOND HYBRID DRIVER RESULTS IN LOSS OF S-BAND CAPABILITY TO UPDATE STATE VECTORS.

SUBSEQUENT LOSS OF UHF CAPABILITY WOULD CAUSE LOSS OF ABILITY TO UPDATE STATE VECTORS WHICH COULD RESULT IN LOSS OF CREW/VEHICLE.

REFERENCES: VS70-740129, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/1R  
MDAC ID: 1535 ABORT: 3/1R

ITEM: HYBRID DRIVER, TYPE III, (J5-Z)  
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM TRANSPONDER POWER CONTROL CIRCUIT
- 4) LOAD CONTROL ASSY (LCA) 2
- 5) HYBRID DRIVER, TYPE III, (J5-Z)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 82V76A17J5Z  
PART NUMBER: MC477-0263-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS HYBRID DRIVER AND A REDUNDANT HYBRID DRIVER IN LCA 3 (IOA 1230) INDEPENDENTLY CONTROL POWER TO THEIR RESPECTIVE REDUNDANT TRANSPONDERS.

INADVERTENT OUTPUT OF ONE OF THE REDUNDANT HYBRID DRIVERS WHERE IT COULD NOT BE DEACTIVATED WOULD HAVE NO HAZARDOUS EFFECT UNTIL A SIMILAR FAILURE CAUSED INADVERTENT APPLICATION OF POWER TO THE REDUNDANT XPONDER CAUSING OSCILLATION OF THE RF SWITCH.

THE DOUBLE FAILURE WOULD CAUSE LOSS OF S-BAND FOR STATE VECTOR UPDATE AND A SUBSEQUENT FAILURE OF UHF COULD RESULT IN LOSS OF CREW/VEHICLE.

REFERENCES: VS70-740129, SPACE SHUTTLE SYSTEMS HANDBOOK

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/1R  
MDAC ID: 1536 ABORT: 3/1R

ITEM: HYBRID DRIVER, TYPE III, A18(J5-P)  
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM TRANSPONDER POWER CONTROL CIRCUIT
- 4) LOAD CONTROL ASSY (LCA) 3
- 5) HYBRID DRIVER, TYPE III, A18(J5-P)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: 82V76A18J5P  
PART NUMBER: MC477-0263-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS HYBRID DRIVER AND A REDUNDANT HYBRID DRIVER IN LCA 2 (IOA 1229) INDEPENDENTLY CONTROL POWER TO THEIR RESPECTIVE REDUNDANT TRANSPONDERS.

INADVERTENT OUTPUT OF ONE OF THE REDUNDANT HYBRID DRIVERS WHERE IT COULD NOT BE DEACTIVATED WOULD HAVE NO HAZARDOUS EFFECT UNTIL A SIMILAR FAILURE CAUSED INADVERTENT APPLICATION OF POWER TO THE REDUNDANT XPONDER CAUSING OSCILLATION OF THE RF SWITCH. THE DOUBLE FAILURE WOULD CAUSE LOSS OF S-BAND FOR STATE VECTOR UPDATE AND A SUBSEQUENT FAILURE OF UHF COULD RESULT IN LOSS OF CREW/VEHICLE.

REFERENCES: VS70-740129, SPACE SHUTTLE SYSTEMS HANDBOOK

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1537 ABORT: 3/2R

ITEM: HYBRID DRIVER, TYPE III, A17(J5-T)  
FAILURE MODE: LOSS OF OUTPUT, OPEN CIRCUIT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM PREAMPLIFIER POWER CONTROL CIRCUIT
- 4) LOAD CONTROL ASSY (LCA) 2
- 5) HYBRID DRIVER, TYPE III, A17(J5-T)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 82V76A17ARI11(J5-T)  
PART NUMBER: MC477-0263-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS HYBRID DRIVER IN LCA 2 AND THE HYBRID DRIVER IN LCA 3 (IOA 1233) CONTROL THE POWER TO THEIR RESPECTIVE S-BAND PREAMPLIFIERS. LOSS OF OUTPUT OF ONE HYBRID DRIVER RESULTS IN LOSS OF POWER TO ONE OF THE REDUNDANT S-BAND PREAMPLIFIERS. A SECOND LOSS RESULTS IN LOSS OF S-BAND PM CAPABILITY. LOSS OF S-BAND PM COULD CAUSE LOSS OF MISSION.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1538 ABORT: 3/2R

ITEM: HYBRID DRIVER, TYPE III, A18(J5-T)  
FAILURE MODE: LOSS OF OUTPUT, OPEN CIRCUIT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM PREAMPLIFIER POWER CONTROL CIRCUIT
- 4) LOAD CONTROL ASSY (LCA) 2
- 5) HYBRID DRIVER, TYPE III, A18(J5-T)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: 82V76A18ARIII(J5-T)  
PART NUMBER: MC477-0263-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS HYBRID DRIVER IN LCA 3 AND THE HYBRID DRIVER IN LCA 2 (IOA 1232) CONTROL THE POWER TO THEIR RESPECTIVE S-BAND PREAMPLIFIERS. LOSS OF OUTPUT OF ONE HRBRID DRIVER RESULTS IN LOSS OF POWER TO ONE OF THE REDUNDANT S-BAND PREAMPLIFIERS. A SECOND LOSS RESULTS IN LOSS OF S-BAND PM CAPABILITY. LOSS OF S-BAND PM COULD CAUSE LOSS OF MISSION.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1539 ABORT: 3/2R

ITEM: HYBRID DRIVER, TYPE III, A17(J5-T)  
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM PREAMPLIFIER POWER CONTROL CIRCUIT
- 4) LOAD CONTROL ASSY (LCA) 3
- 5) HYBRID DRIVER, TYPE III, A17(J5-T)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: 82V76A17ARI(III)(J5-T)  
PART NUMBER: MC477-0263-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS HYBRID DRIVER IN LCA 2 AND THE HYBRID DRIVER IN LCA 3 (IOA 1235) CONTROL THE POWER TO THEIR RESPECTIVE S-BAND PREAMPLIFIERS. INADVERTENT OUTPUT OF ONE HYBRID DRIVER RESULTS UNINTENTIONAL POWER TO ONE OF THE REDUNDANT S-BAND PREAMPLIFIERS. A SECOND FAILURE RESULTS IN LOSS OF S-BAND PM CAPABILITY CAUSED BY OSCILLATION OF THE RF SWITCH. LOSS OF S-BAND PM COULD CAUSE LOSS OF MISSION.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1540 ABORT: 3/2R

ITEM: HYBRID DRIVER, TYPE III, A18(J5-T)  
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM PREAMPLIFIER POWER CONTROL CIRCUIT
- 4) LOAD CONTROL ASSY (LCA) 3
- 5) HYBRID DRIVER, TYPE III, A18(J5-T)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: 82V76A18ARIII(J5-T)  
PART NUMBER: MC477-0263-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS HYBRID DRIVER IN LCA 3 AND THE HYBRID DRIVER IN LCA 2 (IOA 1234) CONTROL THE POWER TO THEIR RESPECTIVE S-BAND PREAMPLIFIERS. INADVERTENT OUTPUT OF ONE HYBRID DRIVER RESULTS UNINTENTIONAL POWER TO ONE OF THE REDUNDANT S-BAND PREAMPLIFIERS. A SECOND FAILURE RESULTS IN LOSS OF S-BAND PM CAPABILITY CAUSED BY OSCILLATION OF THE RF SWITCH. LOSS OF S-BAND PM COULD CAUSE LOSS OF MISSION.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1541 ABORT: 3/2R

ITEM: HYBRID DRIVER, TYPE III, A17(J5-D)  
FAILURE MODE: LOSS OF OUTPUT, OPEN CIRCUIT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM PREAMPLIFIER HEATERS POWER CONTROL CIRCUIT
- 4) LOAD CONTROL ASSY (LCA) 2
- 5) HYBRID DRIVER, TYPE III, A17(J5-D)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: 82V76A17ARIII(J5-D)  
PART NUMBER: MC477-0263-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS HYBRID DRIVER IN LCA 2 AND THE HYBRID DRIVER IN LCA 3 (IOA 1237) CONTROL THE HEATER POWER TO THEIR RESPECTIVE S-BAND PREAMPLIFIERS WHEN IN THE STANDBY MODE.  
LOSS OF OUTPUT OF ONE HYBRID DRIVER WOULD CAUSE LOSS OF REDUNDANCY. LOSS OF THE SECOND HYBRID DRIVER COULD CAUSE DEGRADED PERFORMANCE IN THE STDN HIGH POWER AND TDRS MODES.  
LOSS OF S-BAND PM COULD CAUSE LOSS OF MISSION.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1542 ABORT: 3/2R

ITEM: HYBRID DRIVER, TYPE III, A18(J5-D)  
FAILURE MODE: LOSS OF OUTPUT, OPEN CIRCUIT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM PREAMPLIFIER HEATERS POWER CONTROL CIRCUIT
- 4) LOAD CONTROL ASSY (LCA) 3
- 5) HYBRID DRIVER, TYPE III, A18(J5-D)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 82V76A18ARIIII(J5-D)  
PART NUMBER: MC477-0263-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS HYBRID DRIVER IN LCA 3 AND THE HYBRID DRIVER IN LCA 2 (IOA 1236) CONTROL THE HEATER POWER TO THEIR RESPECTIVE S-BAND PREAMPLIFIERS WHEN IN THE STANDBY MODE.  
LOSS OF OUTPUT OF ONE HYBRID DRIVER WOULD CAUSE LOSS OF REDUNDANCY. LOSS OF THE SECOND HYBRID DRIVER COULD CAUSE DEGRADED PERFORMANCE IN THE STDN HIGH POWER AND TDRS MODES.  
LOSS OF S-BAND PM COULD CAUSE LOSS OF MISSION.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 1543 ABORT: 3/3

ITEM: HYBRID DRIVER, TYPE III, A17(J5-D)  
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM PREAMPLIFIER HEATERS POWER CONTROL CIRCUIT
- 4) LOAD CONTROL ASSY (LCA) 2
- 5) HYBRID DRIVER, TYPE III, A17(J5-D)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 82V76A17ARIIII(J5-D)  
PART NUMBER: MC477-0263-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS HYBRID DRIVER IN LCA 2 CONTROLS THE HEATER POWER TO ITS ASSOCIATED S-BAND PREAMPLIFIER WHEN IT IS IN THE STANDBY MODE. INADVERTENT APPLICATION OF HEATER POWER BY ONE HYBRID DRIVER FAILURE WOULD WASTE ENERGY. THE IMPACT ON VEHICLE ENERGY WOULD HAVE TO BE ASSESSED IN REAL TIME RELATIVE TO ENERGY MARGINS AND WOULD NOT BY ITSELF CAUSE LOSS OF MISSION OR AFFECT CREW/VEHICLE.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 1544 ABORT: 3/3

ITEM: HYBRID DRIVER, TYPE III, A18(J5-D)  
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM PREAMPLIFIER HEATERS POWER CONTROL CIRCUIT
- 4) LOAD CONTROL ASSY (LCA) 3
- 5) HYBRID DRIVER, TYPE III, A18(J5-D)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 82V76A18ARIIII(J5-D)  
PART NUMBER: MC477-0263-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS HYBRID DRIVER IN LCA 3 CONTROLS THE HEATER POWER TO ITS ASSOCIATED S-BAND PREAMPLIFIERS WHEN IT IS IN THE STANDBY MODE. INADVERTENT APPLICATION OF HEATER POWER BY ONE HYBRID DRIVER FAILURE WOULD WASTE ENERGY. THE IMPACT ON VEHICLE ENERGY WOULD HAVE TO BE ASSESSED IN REAL TIME RELATIVE TO ENERGY MARGINS AND WOULD NOT BY ITSELF CAUSE LOSS OF MISSION OR AFFECT CREW/VEHICLE.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87  
SUBSYSTEM: C&T/EPD&C/S-BAND  
MDAC ID: 1545

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 3/2R

ITEM: DIODE, A17CR  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM PREAMPLIFIER HEATERS POWER CONTROL CIRCUIT
- 4) LOAD CONTROL ASSEMBLY (LCA) 2
- 5) DIODE, A17CR
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 83V76A17CR  
PART NUMBER: JANTXV1N5551

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS DIODE IN LCA 2 PROVIDES A PATH FOR PREAMPLIFIER HEATER POWER  
WHEN THE "PREAMP 1 ON" DISCRETE COMMAND IS APPLIED BUT PREVENTS  
PREAMP POWER-UP FOR "STANDBY" (HEATER ON).  
HEATER COULD BE TURNED ON BY ISSUING "STANDBY" COMMAND.  
LOSS OF ALL CAPABILITY TO ACTIVATE A PREAMP COULD CAUSE LOSS OF  
MISSION OBJECTIVES FOR SOME FLIGHTS.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87  
SUBSYSTEM: C&T/EPD&C/S-BAND  
MDAC ID: 1546

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 3/2R

ITEM: DIODE, A18CR  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM PREAMPLIFIER HEATERS POWER CONTROL CIRCUIT
- 4) LOAD CONTROL ASSEMBLY (LCA) 3
- 5) DIODE, A18CR
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: 83V76A18CR  
PART NUMBER: JANTXV1N5551

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS DIODE IN LCA 3 PROVIDES A PATH FOR PREAMPLIFIER HEATER POWER  
WHEN THE "PREAMP 2 ON" DISCRETE COMMAND IS APPLIED BUT PREVENTS  
PREAMP POWER-UP FOR "STANDBY" (HEATER ON).  
HEATER COULD BE TURNED ON BY ISSUING "STANDBY" COMMAND.  
LOSS OF ALL CAPABILITY TO ACTIVATE A PREAMP COULD CAUSE LOSS OF  
MISSION OBJECTIVES FOR SOME FLIGHTS.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87  
SUBSYSTEM: C&T/EPD&C/S-BAND  
MDAC ID: 1547

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 3/2R

ITEM: DIODE, A17CR  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: W.W. ROBINSON

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM PREAMPLIFIER HEATERS POWER CONTROL CIRCUIT
- 4) LOAD CONTROL ASSEMBLY (LCA) 2
- 5) DIODE, A17CR
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: 83V76A17CR  
PART NUMBER: JANTXV1N5551

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS DIODE IN LCA 2 PROVIDES A PATH FOR PREAMPLIFIER HEATER POWER WHEN THE "PREAMP 1 ON" DISCRETE COMMAND IS APPLIED BUT PREVENTS PREAMP POWER-UP FOR "STANDBY".

A SHORTED DIODE WOULD CAUSE THE PREAMPLIFIER TO BE TURNED ON WHEN A "STANDBY" COMMAND IS GIVEN, AND THE TWO PREAMPS COULD CYCLE ON-OFF.

THE SYSTEM COULD BE RESTORED BY CANCELLING THE "STANDBY" COMMAND. LOSS OF ALL CAPABILITY TO ACTIVATE A PREAMP COULD CAUSE LOSS OF MISSION OBJECTIVES FOR SOME FLIGHTS.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87  
SUBSYSTEM: C&T/EPD&C/S-BAND  
MDAC ID: 1548

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 3/2R

ITEM: DIODE, A18CR  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: W.W. ROBINSON

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM PREAMPLIFIER HEATERS POWER CONTROL CIRCUIT
- 4) LOAD CONTROL ASSEMBLY (LCA) 3
- 5) DIODE, A18CR
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: 83V76A18CR  
PART NUMBER: JANTXV1N5551

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS DIODE IN LCA 3 PROVIDES A PATH FOR PREAMPLIFIER HEATER POWER WHEN THE "PREAMP 2 ON" DISCRETE COMMAND IS APPLIED BUT PREVENTS PREAMP POWER-UP FOR "STANDBY".

A SHORTED DIODE WOULD CAUSE THE PREAMPLIFIER TO BE TURNED ON WHEN A "STANDBY" COMMAND IS GIVEN, AND THE TWO PREAMPS COULD CYCLE ON-OFF.

THE SYSTEM COULD BE RESTORED BY CANCELLING THE "STANDBY" COMMAND. LOSS OF ALL CAPABILITY TO ACTIVATE A PREAMP COULD CAUSE LOSS OF MISSION OBJECTIVES FOR SOME FLIGHTS.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1549 ABORT: 3/2R

ITEM: RESISTOR, 1.2K OHM, 2W, A15R1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM PREAMPLIFIER PANEL MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) RESISTOR, 1.2K OHM, 2W, A15R1
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 36V73A1A2A15R1  
PART NUMBER: RWR80S1211BR

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

CURRENT LIMITING RESISTOR R2 PROTECTS THE ASSOCIATED S-BAND  
PREAMPLIFIER POWER CONTROL BUS FROM SHORT CIRCUIT CURRENT  
OVERLOADS WHEN THE GCIL IS IN THE PANEL MODE.  
RESISTOR R1 FAILING OPEN RESULTS IN LOSS OF ABILITY TO POWER UP  
THE ASSOCIATED PREAMPLIFIER WHEN THE GCIL IS IN THE PANEL MODE.  
THE PREAMP COULD BE USED IN THE OPERATIONALLY REDUNDANT COMMAND  
MODE. LOSS OF ALL CAPABILITY TO USE THE S-BAND PM SYSTEM IN HIGH  
POWER MODE COULD CAUSE LOSS OF MISSION OBJECTIVES FOR SOME  
FLIGHTS.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1550 ABORT: 3/2R

ITEM: RESISTOR, 1.2K OHM, 2W, A15R2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM PREAMPLIFIER PANEL MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) RESISTOR, 1.2K OHM, 2W, A15R2
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 36V73A1A2A15R2  
PART NUMBER: RWR80S1211BR

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

CURRENT LIMITING RESISTOR R2 PROTECTS THE ASSOCIATED S-BAND PREAMPLIFIER POWER CONTROL BUS FROM SHORT CIRCUIT CURRENT OVERLOADS WHEN THE GCIL IS IN THE PANEL MODE. RESISTOR R2 FAILING OPEN RESULTS IN LOSS OF ABILITY TO POWER UP THE ASSOCIATED PREAMPLIFIER WHEN THE GCIL IS IN THE PANEL MODE. THE PREAMP COULD BE USED IN THE OPERATIONALLY REDUNDANT COMMAND MODE. LOSS OF ALL CAPABILITY TO USE THE S-BAND PM SYSTEM IN HIGH POWER MODE COULD CAUSE LOSS OF MISSION OBJECTIVES FOR SOME FLIGHTS.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1551 ABORT: 3/2R

ITEM: SWITCH, 4-POLE, 3-POS, A2S10  
FAILURE MODE: FAILS OPEN, FAILS TO TRANSFER

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM PREAMPLIFIER PANEL MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) SWITCH, 4-POLE, 3-POS, A2S10
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 36V73A1A2S10  
PART NUMBER: ME452-0102-7403

CAUSES: MISHANDLING, MECHANICAL/STRUCTURAL MALFUNCTION,  
SHOCK/VIBRATION, CONTAMINATION/CORROSION/DETERIORATION,  
TEMPERATURE LIMITS EXCEEDED.

EFFECTS/RATIONALE:

WHEN THE GCIL IS IN THE PANEL MODE, SWITCH S10 PROVIDES POWER TO  
THE POWER HYBRID DRIVER AND THE HEATER HYBRID DRIVER OF THE S-  
BAND PREAMPLIFIERS.

FAILURE OF SWITCH S10 TO TRANSFER WOULD NOT ALLOW PANEL CABILITY  
TO ACTIVATE THE S-BAND HI-POWER MODE. LOSS OF ALL CAPABILITY TO  
ACTIVATE THE PREAMPLIFIERS IN EITHER PANEL OR COMMAND MODE COULD  
RESULT IN LOSS OF MISSION.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1552 ABORT: 3/2R

ITEM: SWITCH, 4-POLE, 3-POS, A2S10  
FAILURE MODE: FAILS CLOSED, INADVERTENTLY CLOSED (DISCRETE  
COMMAND POLES)

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM PREAMPLIFIER PANEL MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) SWITCH, 4-POLE, 3-POS, A2S10
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: 36V73A1A2S10  
PART NUMBER: ME452-0102-7403

CAUSES: MISHANDLING, MECHANICAL/STRUCTURAL MALFUNCTION,  
SHOCK/VIBRATION, CONTAMINATION/CORROSION/DETERIORATION,  
TEMPERATURE LIMITS EXCEEDED.

EFFECTS/RATIONALE:

WHEN THE GCIL IS IN THE PANEL MODE, SWITCH S10 PROVIDES POWER TO  
THE POWER HYBRID DRIVER AND THE HEATER HYBRID DRIVER OF THE S-  
BAND PREAMPLIFIERS.  
FAILURE OF SWITCH S-10 BY PANEL SWITCHING INADVERTENT CLOSURE OF  
DISCRETE COMMAND CONTACTS WOULD NOT ALLOW PANEL SWITCHING TO THE  
REDUNDANT PREAMPLIFIER.  
LOSS OF ALL CAPABILITY TO ACTIVATE THE PREAMPLIFIERS COULD CAUSE  
LOSS OF MISSION.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 1553 ABORT: 3/3

ITEM: SWITCH, 4-POLE, 3-POS, A2S10  
FAILURE MODE: FAILS CLOSED, INADVERTENTLY CLOSED (INTERLOCK  
POLES)

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM PREAMPLIFIER PANEL MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) SWITCH, 4-POLE, 3-POS, A2S10
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A1A2S10  
PART NUMBER: ME452-0102-7403

CAUSES: MISHANDLING, MECHANICAL/STRUCTURAL MALFUNCTION,  
SHOCK/VIBRATION, CONTAMINATION/CORROSION/DETERIORATION,  
TEMPERATURE LIMITS EXCEEDED.

EFFECTS/RATIONALE:

WHEN THE GCIL IS IN THE PANEL MODE, SWITCH S10 PROVIDES ABILITY  
TO COMMAND POWER ON TO THE POWER HYBRID DRIVER AND THE HEATER  
HYBRID DRIVER OF THE S-BAND PREAMPLIFIERS.

FAILURE OF SWITCH S-10 BY INADVERTENT CLOSURE OF INTERLOCK  
CONTACTS WOULD ALLOW THE POWER AMPLIFIER TO BE TURNED ON WITH THE  
OUTPUT MISROUTED IN THE PREAMPLIFIER.

THIS FAILURE WOULD NOT CAUSE LOSS OF MISSION OR ENDANGER  
CREW/VEHICLE.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1554 ABORT: 3/2R

ITEM: DIODE, A18CR11  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM PREAMPLIFIER PANEL MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) DIODE, A18CR11
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 36V73A1A2A18CR11  
PART NUMBER: JANTXV1N4246

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

DIODE CR11 PROVIDES SHORT CIRCUIT PROTECTION TO THE GCIL DRIVER  
IN CASE OF A SHORT TO GROUND IN SWITCH S10. OPEN CIRCUIT FAILURE  
RESULTS IN INABILITY TO POWER UP ONE OF THE REDUNDANT S-BAND  
PREAMPLIFIERS IN CASE OF A SHORT TO GROUND IN SWITCH S10.  
A SUBSEQUENT FAILURE OF ANALOGOUS DIODE CR12 CAUSES LOSS OF PANEL  
CAPABILITY TO ACTIVATE THE S-BAND HI-POWER MODE. LOSS OF UNLIKE  
REDUNDANCY IN GCIL COMMAND MODE FOR BOTH STRINGS WOULD CAUSE LOSS  
OF ALL ABILITY TO ACTIVATE THE HI-POWER MODE WHICH  
COULD CAUSE LOSS OF MISSION OBJECTIVES.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1555 ABORT: 3/2R

ITEM: DIODE, A18CR12  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM PREAMPLIFIER PANEL MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) DIODE, A18CR12
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 3 ] B [ F ] C [ P ]

LOCATION: 36V73A1A2A18CR12  
PART NUMBER: JANTXV1N4246

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

DIODE CR12 PROVIDES SHORT CIRCUIT PROTECTION TO THE GCIL DRIVER  
IN CASE OF A SHORT TO GROUND IN SWITCH S10 . OPEN CIRCUIT  
FAILURE RESULTS IN INABILITY TO POWER UP ONE OF THE REDUNDANT S-  
BAND PREAMPLIFIERS.  
A SUBSEQUENT FAILURE OF DIODE ANALOGOUS CR11 CAUSES LOSS OF PANEL  
CAPABILITY TO ACTIVATE THE S-BAND HI-POWER MODE. LOSS OF UNLIKE  
REDUNDANCY IN BCIL COMMAND MODE FOR BOTH STRINGS WOULD CAUSE LOSS  
OF ALL ABILITY TO ACTIVATE THE HI-POWER MODE WHICH  
COULD CAUSE LOSS OF MISSION OBJECTIVES.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 1556 ABORT: 3/3

ITEM: DIODE, A18CR11  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM PREAMPLIFIER PANEL MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) DIODE, A18CR11
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A1A2A18CR11  
PART NUMBER: JANTXV1N4246

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

DIODE CR13 PROTECTS AGAINST REVERSE CURRENT LEAKAGE FROM THE  
ASSOCIATED GCIL DRIVER VIA PANEL CONTROL CIRCUIT IN CASE OF A  
SHORT TO GROUND IN THE ASSOCIATED PANEL CONTROL SWITCH. FAILURE  
OF CR13 SHORTED WOULD NOT AFFECT MISSION OR CREW/VEHICLE.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 1557 ABORT: 3/3

ITEM: DIODE, A18CR12  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM PREAMPLIFIER PANEL MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) DIODE, A18CR12
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A1A2A18CR12  
PART NUMBER: JANTXV1N4246

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

DIODE CR12 PROTECTS AGAINST REVERSE CURRENT LEAKAGE FROM THE  
ASSOCIATED GCIL DRIVER VIA PANEL CONTROL CIRCUIT IN CASE OF A  
SHORT TO GROUND IN THE ASSOCIATED PANEL CONTROL SWITCH. FAILURE  
OF CR12 SHORTED WOULD NOT AFFECT MISSION OR CREW/VEHICLE.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87  
SUBSYSTEM: C&T/EPD&C/S-BAND  
MDAC ID: 1558

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 3/2R

ITEM: FUSE, 1AMP, A2F6  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM PREAMPLIFIER GROUND COMMAND POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) FUSE, 1 AMP, A2F6
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 36V73A1A2F6  
PART NUMBER: ME451-0018-0100

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

FUSE F6 PROTECTS THE GCIL COMMAND DRIVER POWER CONTROL CIRCUIT OF  
S-BAND PM PREAMPLIFIER 1.  
FUSE F6 FAILING OPEN CAUSES LOSS OF GROUND COMMAND AND KEYBOARD  
CAPABILITY TO POWER UP PREAMP 1. ON LOSS OF CAPABILITY TO  
ACTIVATE PREAMP 1 BY COMMAND, GCIL PANEL MODE WOULD BE AVAILABLE.  
LOSS OF ALL CAPABILITY TO ACTIVATE PREAMPS 1 AND 2 EITHER BY  
COMMAND OR PANEL CONTROL COULD CAUSE LOSS OF MISSION OBJECTIVES  
FOR SOME FLIGHTS.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87  
SUBSYSTEM: C&T/EPD&C/S-BAND  
MDAC ID: 1559

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 3/2R

ITEM: FUSE, 1AMP, A2F13  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM PREAMPLIFIER GROUND COMMAND POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) FUSE, 1 AMP, A2F13
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES	
FLIGHT PHASE	HDW/FUNC	ABORT
PRELAUNCH:	3/3	RTLS: 3/3
LIFTOFF:	3/3	TAL: 3/3
ONORBIT:	3/2R	AOA: 3/3
DEORBIT:	3/3	ATO: 3/2R
LANDING/SAFING:	3/3	

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 36V73A1A2F13  
PART NUMBER: ME451-0018-0100

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

FUSE F13 PROTECTS THE GCIL COMMAND DRIVER POWER CONTROL CIRCUIT  
OF S-BAND PM PREAMPLIFIER 1.

FUSE F13 FAILING OPEN CAUSES LOSS OF GROUND COMMAND AND KEYBOARD  
CAPABILITY TO POWER UP PREAMP 2. ON LOSS OF CAPABILITY TO  
ACTIVATE PREAMP 2 BY COMMAND, GCIL PANEL MODE WOULD BE AVAILABLE.  
LOSS OF ALL CAPABILITY TO ACTIVATE PREAMPS 1 AND 2 EITHER BY  
COMMAND OR PANEL CONTROL COULD CAUSE LOSS OF MISSION OBJECTIVES  
FOR SOME FLIGHTS.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/05/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1560 ABORT: 3/2R

ITEM: REMOTE POWER CONTROLLER, 20 AMP, RPC35  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) POWER CONTROL CIRCUIT
- 4) POWER CONTROL ASSY (PCA) 2
- 5) REMOTE POWER CONTROLLER, 20 AMP, RPC35
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 36V76A23RPC35  
PART NUMBER: MC450-0017-1200

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

RPC 35 IN PCA 2 CONTROLS APPLICATION OF POWER TO S-BAND PM POWER  
AMPLIFIER 1.

LOSS OF OUTPUT BY THE RPC RESULTS IN LOSS OF USE OF PA 1.

REDUNDANT SET RPC 44/PA 2 WOULD BE SELECTED.

LOSS OF S-BAND PM HI-POWER MODE (BOTH PA'S) COULD RESULT IN LOSS  
OF MISSION.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/05/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1561 ABORT: 3/2R

ITEM: REMOTE POWER CONTROLLER, 20 AMP, RPC44  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) POWER CONTROL CIRCUIT
- 4) POWER CONTROL ASSY (PCA) 3
- 5) REMOTE POWER CONTROLLER, 20 AMP, RPC44
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: 36V76A23RPC44  
PART NUMBER: MC450-0017-1200

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

RPC 44 IN PCA 3 CONTROLS APPLICATION OF POWER TO S-BAND PM POWER  
AMPLIFIER 2.

LOSS OF OUTPUT BY THE RPC RESULTS IN LOSS OF USE OF THE PA 2.

REDUNDANT SET RPC35/PA 1 WOULD BE SELECTED.

LOSS OF S-BAND PM HI-POWER MODE (BOTH PA'S) COULD RESULT IN LOSS  
OF MISSION.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/05/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 1562 ABORT: 3/3

ITEM: REMOTE POWER CONTROLLER, 20 AMP, RPC35  
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) POWER CONTROL CIRCUIT
- 4) POWER CONTROL ASSY (PCA) 2
- 5) REMOTE POWER CONTROLLER, 20 AMP, RPC35
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V76A23RPC35  
PART NUMBER: MC450-0017-1200

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

RPC 35 IN PCA 2 CONTROLS APPLICATION OF POWER TO S-BAND PM POWER  
AMPLIFIER 1.  
INADVERTENT OUTPUT OF THE RPC COULD APPLY POWER TO THE STANDBY S-  
BAND PA, WASTING ABOUT 20 WATTS.  
THE UNINTENTIONAL CONSUMPTION OF 20 WATTS WOULD NOT AFFECT THE  
MISSION OR POSE A HAZARD TO CREW/VEHICLE.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/05/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 1563 ABORT: 3/3

ITEM: REMOTE POWER CONTROLLER, 20 AMP, RPC44  
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) POWER CONTROL CIRCUIT
- 4) POWER CONTROL ASSY (PCA) 3
- 5) REMOTE POWER CONTROLLER, 20 AMP, RPC44
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V76A23RPC44  
PART NUMBER: MC450-0017-1200

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

RPC 44 IN PCA 3 CONTROLS APPLICATION OF POWER TO THE S-BAND PM  
POWER AMPLIFIER 2.

INADVERTENT OUTPUT OF THE RPC COULD APPLY POWER TO THE STANDBY S-  
BAND PA, WASTING ABOUT 20 WATTS.

THE UNINTENTIONAL CONSUMPTION OF 20 WATTS WOULD NOT AFFECT THE  
MISSION OR POSE A HAZARD TO CREW/VEHICLE.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1564 ABORT: 3/2R

ITEM: HYBRID DRIVER, TYPE II, A17(J4-127)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) OPERATE COMMAND
- 4) LOAD CONTROL ASSY (LCA) 2
- 5) HYBRID DRIVER, TYPE II, A17(J4-127)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: 82V76A17ARII(J4-127)  
PART NUMBER: MC477-0262-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS HYBRID DRIVER IN LCA 2 PROVIDES A 1 SECOND TIME DELAY FOR  
THE OPERATE COMMAND TO THE S-BAND PM POWER AMPLIFIER.  
LOSS OF OUTPUT BY THIS HYBRID DRIVER WOULD RESULT IN LOSS OF ONE  
OF THE REDUNDANT S-BAND PM POWER AMPLIFIERS. SUBSEQUENT LOSS OF  
THE OTHER HYBRID DRIVER WOULD RESULT IN LOSS OF THE S-BAND PM  
DOWNLINK CAPABILITY IN THE S-BAND HI-POWER MODE.  
LOSS OF DOWNLINK IN THE S-BAND HI-POWER MODE COULD RESULT IN LOSS  
OF MISSION.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1565 ABORT: 3/2R

ITEM: HYBRID DRIVER, TYPE II, A18(J4-127)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) OPERATE COMMAND
- 4) LOAD CONTROL ASSY (LCA) 3
- 5) HYBRID DRIVER, TYPE II, A18(J4-127)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 82V76A18ARII(J4-127)  
PART NUMBER: MC477-0262-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS HYBRID DRIVER IN LCA 3 PROVIDES A 1 SECOND TIME DELAY FOR  
THE OPERATE COMMAND TO THE S-BAND PM POWER AMPLIFIER.  
LOSS OF OUTPUT BY THIS HYBRID DRIVER WOULD RESULT IN LOSS OF ONE  
OF THE REDUNDANT S-BAND PM POWER AMPLIFIERS. SUBSEQUENT LOSS OF  
THE OTHER HYBRID DRIVER WOULD RESULT IN LOSS OF THE S-BAND PM  
DOWNLINK CAPABILITY IN THE S-BAND HI-POWER MODE.  
LOSS OF DOWNLINK IN THE S-BAND HI-POWER MODE COULD RESULT IN LOSS  
OF MISSION.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK.



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 1566 ABORT: 3/3

ITEM: HYBRID DRIVER, TYPE II, A17(J4-127)  
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) OPERATE COMMAND
- 4) LOAD CONTROL ASSY (LCA) 2
- 5) HYBRID DRIVER, TYPE II, A17(J4-127)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 82V76A17ARII(J4-127)  
PART NUMBER: MC477-0262-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS REDUNDANT HYBRID DRIVER IN LCA 2 PROVIDES A 1 SECOND TIME  
DELAY FOR THE OPERATE COMMAND TO THE S-BAND PM POWER AMPLIFIER.  
INADVERTENT OUTPUT OF THIS HYBRID DRIVER WOULD RESULT IN  
CONTINUOUS OPERATION OF THE S-BAND POWER AMPLIFIER WHICH COULD BE  
HALTED WITH REMOVAL OF THE STANDBY COMMAND TO THAT AMPLIFIER.  
NO EFFECT ON MISSION OR CREW/VEHICLE.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 1567 ABORT: 3/3

ITEM: HYBRID DRIVER, TYPE II, A18(J4-127)  
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) OPERATE COMMAND
- 4) LOAD CONTROL ASSY (LCA) 3
- 5) HYBRID DRIVER, TYPE II, A18(J4-127)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 82V76A18ARII(J4-127)  
PART NUMBER: MC477-0262-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS REDUNDANT HYBRID DRIVER IN LCA 3 PROVIDES A 1 SECOND TIME  
DELAY FOR THE OPERATE COMMAND TO THE S-BAND PM POWER AMPLIFIER.  
INADVERTENT OUTPUT OF THIS HYBRID DRIVER WOULD RESULT IN  
CONTINUOUS OPERATION OF THE S-BAND POWER AMPLIFIER WHICH COULD BE  
HALTED WITH REMOVAL OF THE STANDBY COMMAND TO THAT AMPLIFIER.  
NO EFFECT ON MISSION OR CREW/VEHICLE.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87  
SUBSYSTEM: C&T/EPD&C/S-BAND  
MDAC ID: 1568

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 3/2R

ITEM: FUSE, 1 AMP, A2F31  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) POWER INDICATOR CIRCUIT
- 4) POWER CONTROL ASSY (PCA) 2
- 5) FUSE, 1 AMP, A2F31
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 36V73A1A2F31  
PART NUMBER: ME451-0009-0103

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

FUSE F31 PROVIDES OVERCURRENT PROTECTION TO ONE OF THE REDUNDANT  
POWER AMPLIFIER POWER INDICATOR CIRCUITS AND IS REQUIRED FOR  
NORMAL OPERATION OF THE POWER AMPLIFIERS.  
FAILURE OF F31 RESULTS IN LOSS OF OPERATION OF THE ASSOCIATED S-  
BAND PM POWER AMPLIFIER. SUBSEQUENT FAILURE OF F11 RESULTS IN  
LOSS OF BOTH POWER AMPLIFIERS.  
LOSS OF BOTH POWER AMPLIFIERS RESULTS IN LOSS OF DOWNLINK IN THE  
S-BAND HI-POWER MODE AND COULD CAUSE MISSION LOSS.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1569 ABORT: 3/2R

ITEM: FUSE, 1AMP, A2F11  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) POWER INDICATOR CIRCUIT
- 4) POWER CONTROL ASSY (PCA) 3
- 5) FUSE, 1 AMP, A2F11
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES	
FLIGHT PHASE	HDW/FUNC	ABORT
PRELAUNCH:	3/3	RTLS: 3/3
LIFTOFF:	3/3	TAL: 3/3
ONORBIT:	3/2R	AOA: 3/3
DEORBIT:	3/3	ATO: 3/2R
LANDING/SAFING:	3/3	

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 36V73A1A2F11  
PART NUMBER: ME451-0009-0103

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

FUSE F11 PROVIDES OVERCURRENT PROTECTION TO ONE OF THE REDUNDANT  
POWER AMPLIFIER POWER INDICATOR CIRCUITS AND IS REQUIRED FOR  
NORMAL OPERATION OF THE POWER AMPLIFIERS. FAILURE OF F11 RESULTS IN LOSS OF OPERATION OF THE ASSOCIATED S-  
BAND PM POWER AMPLIFIER. SUBSEQUENT FAILURE OF F31 RESULTS IN  
LOSS OF BOTH POWER AMPLIFIERS.  
LOSS OF BOTH POWER AMPLIFIERS RESULTS IN LOSS OF DOWNLINK IN THE  
S-BAND HI-POWER MODE AND COULD CAUSE MISSION LOSS.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1570 ABORT: 3/2R

ITEM: SWITCH, 4-POLE, 3-POS, A3S12  
FAILURE MODE: FAILS TO TRANSFER

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) OPERATE
- 4) PANEL A1A3
- 5) SWITCH, 4-POLE, 3-POS, A3S12
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 36V73A1A3S12  
PART NUMBER: ME452-0102-7403

CAUSES: MISHANDLING, MECHANICAL/STRUCTURAL MALFUNCTION,  
SHOCK/VIBRATION, CONTAMINATION/CORROSION/DETERIORATION,  
TEMPERATURE LIMITS EXCEEDED.

EFFECTS/RATIONALE:

SWITCH S12 PROVIDES A STANDBY COMMAND TO THE RPC IN THE  
ASSOCIATED POWER AMPLIFIER POWER CIRCUIT AND AN OPERATE SIGNAL TO  
THE RESPECTIVE HYBRID DRIVER WHEN THE GCIL IS IN THE PANEL MODE.  
FAILURE OF S12 WOULD RESULT IN LOSS OF ABILITY TO POWER UP ONE OR  
BOTH OF THE S-BAND POWER AMPLIFIERS.  
LOSS OF BOTH S-BAND PM POWER AMPLIFIERS AND SUBSEQUENT LOSS OF  
GCIL COULD RESULT IN LOSS OF MISSION.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1571 ABORT: 3/2R

ITEM: SWITCH, 4-POLE, 3-POS, A3S12  
FAILURE MODE: FAILS SHORTED, ADJACENT CONTACTS

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) OPERATE
- 4) PANEL A1A3
- 5) SWITCH, 4-POLE, 3-POS, A3S12
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/2R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/2R	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: 36V73A1A3S12  
PART NUMBER: ME452-0102-7403

CAUSES: MISHANDLING, MECHANICAL/STRUCTURAL MALFUNCTION,  
SHOCK/VIBRATION, CONTAMINATION/CORROSION/DETERIORATION,  
TEMPERATURE LIMITS EXCEEDED.

EFFECTS/RATIONALE:

SWITCH S12 PROVIDES A STANDBY COMMAND TO THE RPC IN THE  
ASSOCIATED POWER AMPLIFIER POWER CIRCUIT AND AN OPERATE SIGNAL TO  
THE RESPECTIVE HYBRID DRIVER WHEN THE GCIL IS IN THE PANEL MODE.  
FAILURE OF S12 WOULD RESULT IN LOSS OF ABILITY TO POWER DOWN ONE  
OR BOTH OF THE S-BAND POWER AMPLIFIERS.  
WITH BOTH POWER AMPLIFIERS POWERED UP PANEL CONTROL IS LOST AND  
SUBSEQUENT FAILURE OF THE GCIL COULD RESULT IN LOSS OF MISSION.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1572 ABORT: 3/2R

ITEM: HYBRID DRIVER, TYPE I, A17(J4-49)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) OPERATE INTERLOCK
- 4) PANEL A1A2
- 5) HYBRID DRIVER, TYPE I, A17(J4-49)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 82V76A17ARI(J4-49)  
PART NUMBER: MC477-0261-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS HYBRID DRIVER PROVIDES POWER TO THE INTERLOCK POLES  
PREAMPLIFIER POWER SWITCH IN THE PANEL MODE.  
FAILURE RESULTS IN LOSS OF POWER TO THE ASSOCIATED POWER  
AMPLIFIER FROM THE PANEL. SUBSEQUENT FAILURE OF THE REDUNDANT  
HYBRID DRIVER RESULTS IN LOSS OF PANEL CONTROL OF POWER  
AMPLIFIERS.

SUBSEQUENT LOSS OF GCIL WOULD CAUSE LOSS OF S-BAND DOWNLINK IN  
THE HI-POWER MODE WHICH COULD RESULT IN LOSS OF MISSION.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1573 ABORT: 3/2R

ITEM: HYBRID DRIVER, TYPE I, A18(J4-49)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) OPERATE INTERLOCK
- 4) PANEL A1A2
- 5) HYBRID DRIVER, TYPE I, A18(J4-49)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: 82V76A18ARI(J4-49)  
PART NUMBER: MC477-0261-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS HYBRID DRIVER PROVIDES POWER TO THE INTERLOCK POLES  
PREAMPLIFIER POWER SWITCH IN THE PANEL MODE.  
FAILURE RESULTS IN LOSS OF POWER TO THE ASSOCIATED POWER  
AMPLIFIER FROM THE PANEL. SUBSEQUENT FAILURE OF THE REDUNDANT  
HYBRID DRIVER RESULTS IN LOSS OF PANEL CONTROL OF POWER  
AMPLIFIERS.

SUBSEQUENT LOSS OF GCIL WOULD CAUSE LOSS OF S-BAND DOWNLINK IN  
THE HI-POWER MODE WHICH COULD RESULT IN LOSS OF MISSION.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 1574 ABORT: 3/3

ITEM: HYBRID DRIVER, TYPE I, A17(J4-49)  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) OPERATE INTERLOCK
- 4) PANEL A1A2
- 5) HYBRID DRIVER, TYPE I, A17(J4-49)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 82V76A17ARI(J4-49)  
PART NUMBER: MC477-0261-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS HYBRID DRIVER PROVIDES POWER TO THE INTERLOCK POLES OF THE  
PREAMPLIFIER POWER SWITCH IN THE PANEL MODE.  
THIS FAILURE WOULD NOT RESULT IN LOSS OF MISSION NOR ENDANGER  
CREW/VEHICLE.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 1575 ABORT: 3/3

ITEM: HYBRID DRIVER, TYPE I, A18(J4-49)  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) OPERATE INTERLOCK
- 4) PANEL A1A2
- 5) HYBRID DRIVER, TYPE I, A18(J4-49)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 82V76A18ARI(J4-49)  
PART NUMBER: MC477-0261-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS HYBRID DRIVER PROVIDES POWER TO THE INTERLOCK POLES OF THE  
PREAMPLIFIER POWER SWITCH IN THE PANEL MODE.  
THIS FAILURE WOULD NOT RESULT IN LOSS OF MISSION NOR ENDANGER  
CREW/VEHICLE.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: , C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1576 ABORT: 3/2R

ITEM: SWITCH, 2-POLE, 3-POS, A2S11  
FAILURE MODE: FAILS OPEN, FAILS TO TRANSFER

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) STANDBY COMMAND
- 4) PANEL A1A2
- 5) SWITCH, 2-POLE, 3-POS, A2S11
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 36V73A1A2S11  
PART NUMBER: ME452-0102-7203

CAUSES: MISHANDLING, MECHANICAL/STRUCTURAL MALFUNCTION,  
SHOCK/VIBRATION, CONTAMINATION/CORROSION/DETERIORATION,  
TEMPERATURE LIMITS EXCEEDED.

EFFECTS/RATIONALE:

SWITCH S11 PROVIDES THE STANDBY COMMAND TO THE RPC IN THE S-BAND  
PM POWER AMPLIFIER POWER CONTROL CIRCUIT WHEN THE GCIL IS IN THE  
PANEL MODE.

THIS FAILURE WOULD RESULT IN LOSS OF ABILITY TO POWER UP THE S-  
BAND PM POWER AMPLIFIER WHILE IN THE PANEL MODE.

FAILURE SUCH THAT NEITHER S-BAND PM POWER AMPLIFIER CAN BE  
ENABLED AND SUBSEQUENT FAILURE OF THE GCIL COULD RESULT IN LOSS  
OF MISSION.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 1577 ABORT: 3/3

ITEM: SWITCH, 2-POLE, 3-POS, A2S11  
FAILURE MODE: FAILS SHORTED, ADACENT CONTACTS

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) STANDBY COMMAND
- 4) PANEL A1A2
- 5) SWITCH, 2-POLE, 3-POS, A2S11
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A1A2S11  
PART NUMBER: ME452-0102-7203

CAUSES: MISHANDLING, MECHANICAL/STRUCTURAL MALFUNCTION,  
SHOCK/VIBRATION, CONTAMINATION/CORROSION/DETERIORATION,  
TEMPERATURE LIMITS EXCEEDED.

EFFECTS/RATIONALE:

SWITCH S11 PROVIDES THE STANDBY COMMAND TO THE RPC IN THE S-BAND  
PM POWER AMPLIFIER POWER CONTROL CIRCUIT WHEN THE GCIL IS IN THE  
PANEL MODE.  
THIS FAILURE WOULD CAUSE AN UNPLANNED 20 WATT POWER DRAIN.  
THIS FAILURE WOULD NOT CAUSE LOSS OF MISSION NOR ENDANGER  
CREW/VEHICLE.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1578 ABORT: 3/2R

ITEM: DIODE, A18CR13  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) PANEL MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) DIODE, A18CR13
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: 36V73A1A2A18CR13  
PART NUMBER: JANTXV1N4246

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

DIODE CR13 IN THE PA1 POWER CONTROL CIRCUIT PROTECTS THE GCIL DRIVER FROM SWITCH S10 SHORT TO GROUND ON THE LOAD SIDE CONTACT. OPEN FAILURE OF CR13 WOULD PREVENT PA1 POWER-UP VIA PANEL SWITCH S10 (PANEL MODE). OPERATIONAL REDUNDANCY FOR PA 1 POWER EXISTS IN GCIL COMMAND MODE, AND HARDWARE REDUNDANCY IN PA 2. LOSS OF ALL CAPABILITY TO POWER PA 1 OR PA 2 IN EITHER PANEL OR COMMAND MODE COULD RESULT IN LOSS OF MISSION OBJECTIVES.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1579 ABORT: 3/2R

ITEM: DIODE, A18CR14  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) PANEL MODE PA 2 POWER CONTROL CIRCUIT

- 4) PANEL A1A2
- 5) DIODE, A18CR14
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 36V73A1A2A18CR14  
PART NUMBER: JANTXV1N4246

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

DIODE CR14 IN THE PA2 POWER CONTROL CIRCUIT PROTECTS THE GCIL DRIVER FROM SWITCH S10 SHORT TO GROUND ON THE LOAD SIDE CONTACT. OPEN FAILURE OF CR14 WOULD PREVENT PA2 POWER-UP VIA PANEL SWITCH S10 (PANEL MODE). OPERATIONAL REDUNDANCY FOR PA 2 POWER EXISTS IN GCIL COMMAND MODE, AND HARDWARE REDUNDANCY IN PA 2. LOSS OF ALL CAPABILITY TO POWER PA 1 OR PA 2 IN EITHER PANEL OR COMMAND MODE COULD RESULT IN LOSS OF MISSION OBJECTIVES.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1580 ABORT: 3/2R

ITEM: DIODE, A18CR15  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) PANEL MODE PA 1 STANDBY POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) DIODE, A18CR15
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/2R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/2R	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: 36V73A1A2A18CR15  
PART NUMBER: JANTXV1N4246

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

DIODE CR14 IN THE PA2 STANDBY POWER CONTROL CIRCUIT PROTECTS THE GCIL DRIVER FROM SWITCH S10 SHORT TO GROUND ON THE LOAD SIDE CONTACT. OPEN FAILURE OF CR14 WOULD PREVENT PA2 POWER-UP VIA PANEL SWITCH S10 (PANEL MODE). OPERATIONAL REDUNDANCY FOR PA 2 POWER EXISTS IN GCIL COMMAND MODE, AND HARDWARE REDUNDANCY IN PA 1. LOSS OF ALL CAPABILITY TO PLACE PA1 OR PA2 IN STANDBY IN EITHER PANEL OR COMMAND MODE COULD RESULT IN LOSS OF MISSION OBJECTIVES.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87  
SUBSYSTEM: C&T/EPD&C/S-BAND  
MDAC ID: 1581

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 3/2R

ITEM: DIODE, A16CR16  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) PANEL MODE PA 2 STANDBY POWER

CONTROL CIRCUIT

- 4) PANEL A1A2
- 5) DIODE, A16CR16
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 36V73A1A2A18CR16  
PART NUMBER: JANTXV1N4246

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

DIODE CR15 IN THE PA1 STANDBY POWER CONTROL CIRCUIT PROTECTS THE GCIL DRIVER FROM SWITCH S10 AND S11 SHORT TO GROUND ON THE LOAD SIDE CONTACTS. OPEN FAILURE OF CR15 WOULD PREVENT PA 1 STANDBY VIA PANEL SWITCH S11 (PANEL MODE).

OPERATIONAL REDUNDANCY FOR PA 1 STANDBY EXISTS IN GCIL COMMAND MODE, AND HARDWARE REDUNDANCY IN PA 2. LOSS OF CAPABILITY TO PLACE EITHER PA IN STANDBY TO WARM UP THE AMPLIFIER BEFORE POWER-UP IN EITHER PANEL OR COMMAND MODE COULD RESULT IN LOSS OF MISSION OBJECTIVES.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 1582 ABORT: 3/3

ITEM: DIODE, A18CR13  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) PANEL MODE PA 1 POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) DIODE, A18CR13
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A1A2A18CR13  
PART NUMBER: JANTXV1N4246

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

DIODE CR13 PROTECT THE GCIL DRIVER AGAINST REVERSE CURRENT  
LEAKAGE FROM THE DRIVER IN CASE IF A SHORT TO GROUND ON THE LOAD  
SIDE CONTACT OF SWITCH S10. SHORT CIRCUIT FAILURE OF CR13 WOULD  
NOT AFFECT MISSION OR CREW/VEHICLE.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87  
SUBSYSTEM: C&T/EPD&C/S-BAND  
MDAC ID: 1583

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: DIODE, A18CR14  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: W.W. ROBINSON

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) PANEL MODE PA 2 POWER CONTROL CIRCUIT

- 4) PANEL A1A2
- 5) DIODE, A18CR14
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A1A2A18CR14  
PART NUMBER: JANTXV1N4246

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

DIODE CR14 PROTECT THE GCIL DRIVER AGAINST REVERSE CURRENT  
LEAKAGE FROM THE DRIVER IN CASE IF A SHORT TO GROUND ON THE LOAD  
SIDE CONTACT OF SWITCH S10. SHORT CIRCUIT FAILURE OF CR14 WOULD  
NOT AFFECT MISSION OR CREW/VEHICLE.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 1584 ABORT: 3/3

ITEM: DIODE, A18CR15  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) PANEL MODE PA 1 STANDBY POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) DIODE, A18CR15
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A1A2A18CR15  
PART NUMBER: JANTXV1N4246

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

DIODE CR15 IN THE PA 1 STANDBY POWER CONTROL CIRCUIT PROTECTS THE GCIL DRIVER AGAINST REVERSE CURRENT LEAKAGE FROM THE DRIVER IN CASE OF SWITCH S10 AND S11 SHORT TO GROUND ON THE LOAD SIDE CONTACTS. SHORT CIRCUIT FAILURE OF CR15 WOULD NOT AFFECT MISSION OR CREW/VEHICLE.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87  
SUBSYSTEM: C&T/EPD&C/S-BAND  
MDAC ID: 1585

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: DIODE, A18CR16  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: W.W. ROBINSON

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) PANEL MODE PA 2 STANDBY POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) DIODE, A18CR16
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A1A2A18CR16  
PART NUMBER: JANTXV1N4246

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

DIODE CR16 IN THE PA2 STANDBY POWER CONTROL CIRCUIT PROTECTS THE GCIL DRIVER AGAINST REVERSE CURRENT LEAKAGE FROM THE DRIVER IN CASE OF SWITCH S10 AND S11 SHORT TO GROUND ON THE LOAD SIDE CONTACTS. SHORT CIRCUIT FAILURE OF CR16 WOULD NOT AFFECT MISSION OR CREW/VEHICLE.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87  
SUBSYSTEM: C&T/EPD&C/S-BAND  
MDAC ID: 1586

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 3/2R

ITEM: FUSE, 1AMP, A2F7  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) GROUND COMMAND POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) FUSE, 1 AMP, A2F7
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: 36V73A1A2F7  
PART NUMBER: ME451-0018-0100

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

FUSE F7 PROVIDES OVERCURRENT PROTECTION TO THE S-BAND PM POWER  
AMPLIFIER GROUND COMMAND INTERFACE LOGIC (GCIL) POWER CONTROL  
CIRCUIT AND BUS BC1.  
FAILURE OF FUSE F7 RESULTS IN LOSS OF GROUND COMMAND CAPABILITY  
TO APPLY POWER TO ONE OF THE S-BAND POWER AMPLIFIERS WHICH  
RESULTS IN LOSS OF REDUNDANCY. LOSS OF ALL REDUNDANCY TO CONTROL  
PAs 1 AND 2 IN PANEL OR COMMAND MODE COULD RESULT IN LOSS  
OF MISSION.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1587 ABORT: 3/2R

ITEM: FUSE, 1AMP, A2F14  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) GROUND COMMAND POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) FUSE, 1 AMP, A2F14
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 36V73A1A2F14  
PART NUMBER: ME451-0018-0100

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

FUSE F14 PROVIDES OVERCURRENT PROTECTION TO THE S-BAND PM POWER  
AMPLIFIER GROUND COMMAND INTERFACE LOGIC (GCIL) POWER CONTROL  
CIRCUIT AND BUS BC2.

FAILURE OF FUSE F14 RESULTS IN LOSS OF GROUND COMMAND CAPABILITY  
TO APPLY POWER TO ONE OF THE S-BAND POWER AMPLIFIERS WHICH  
RESULTS IN LOSS OF REDUNDANCY. LOSS OF ALL REDUNDANCY TO CONTROL  
PAs 1 AND 2 IN PANEL OF COMMAND MODE COULD RESULT IN LOSS  
OF MISSION.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1588 ABORT: 3/2R

ITEM: RESISTOR, 1.2K OHM, 2-W, A15R3  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) GROUND COMMAND POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) RESISTOR, 1.2K OHM, 2-W, A15R3
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 36V73A1A2A15R3  
PART NUMBER: RWR80S1211BR

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

CURRENT LIMITING RESISTOR R3 PROTECTS BUS BC1 AND THE S-BAND  
POWER AMPLIFIER POWER CONTROL CIRCUIT WIRING FROM CURRENT  
OVERLOADS WHEN THE GCIL IS IN THE PANEL MODE.  
RESISTOR R3 FAILING OPEN RESULTS IN LOSS OF ABILITY TO POWER UP  
THE ASSOCIATED PREAMPLIFIER WHEN THE GCIL IS IN THE PANEL MODE.  
SUBSEQUENT FAILURE OF RESISTOR R4 (IOA 1284) WOULD CAUSE LOSS OF  
BOTH POWER AMPLIFIERS IN THE PANEL MODE. LOSS OF  
ALL CAPABILITY TO OPERATE PA1 OR PA2 IN EITHER PANEL OR COMMAND  
MODE COULD CAUSE LOSS OF MISSION.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1589 ABORT: 3/2R

ITEM: RESISTOR, 1.2K OHM, 2-W, A15R4  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) PM POWER AMPLIFIER (PA) GROUND COMMAND POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) RESISTOR, 1.2K OHM, 2-W, A15R4
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 36V73A1A2A15R4  
PART NUMBER: RWR80S1211BR

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

CURRENT LIMITING RESISTOR R4 PROTECTS BUS BC2 AND THE S-BAND  
POWER AMPLIFIER POWER CONTROL CIRCUIT WIRING FROM CURRENT  
OVERLOADS WHEN THE GCIL IS IN THE PANEL MODE.  
RESISTOR R4 FAILING OPEN RESULTS IN LOSS OF ABILITY TO POWER UP  
THE ASSOCIATED PREAMPLIFIER WHEN THE GCIL IS IN THE PANEL MODE.  
SUBSEQUENT FAILURE OF RESISTOR R3 (IOA 1283) WOULD CAUSE LOSS OF  
BOTH POWER AMPLIFIERS IN THE PANEL MODE. LOSS OF  
ALL CAPABILITY TO OPERATE PA1 OR PA2 IN EITHER PANEL OR COMMAND  
MODE COULD CAUSE LOSS OF MISSION.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1590 ABORT: 3/2R

ITEM: HYBRID DRIVER, TYPE III, A17(J4-117)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) ANTENNA SWITCH ASSY & SBCA PANEL MODE POWER CONTROL CIRCUIT
- 4) FORWARD LOAD CONTROL ASSY (LCA) 2
- 5) HYBRID DRIVER, TYPE III, A17(J4-117)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: 82V76A17ARIII(J4-117)  
PART NUMBER: MC477-0263-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS DEDICATED HYBRID DRIVER IN FORWARD LCA 2 PROVIDES POWER TO THE CONTROL LOGIC CIRCUIT OF THE S-BAND ANTENNA SWITCH ASSY AND SWITCH BEAM CONTROL ASSY (SBCA). FAILURE OF THIS DEDICATED HYBRID DRIVER RESULTS IN LOSS OF ONE OF THE LOGIC CIRCUITS CONTROLLING QUAD ANTENNA SELECTION SBCA. SUBSEQUENT FAILURE OF THE REDUNDANT DEDICATED HYBRID DRIVER RESULTS IN LOSS OF ANTENNA SWITCHING CAPABILITY, EITHER BY GPC OR PANEL CONTROL. LOSS OF MISSION COULD RESULT IF QUAD ANTENNA CONTROL IS LOST.

REFERENCES: VS70-740259, SPACE SHUTTLE SYSTEMS HANDBOOK

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1591 ABORT: 3/2R

ITEM: HYBRID DRIVER, TYPE III, A18(J4-117)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) ANTENNA SWITCH ASSY & SBCA PANEL MODE POWER CONTROL CIRCUIT
- 4) FORWARD LOAD CONTROL ASSY (LCA) 3
- 5) HYBRID DRIVER, TYPE III, A18(J4-117)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/2R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/2R	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: 82V76A18ARIIII(J4-117)  
PART NUMBER: MC477-0263-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS DEDICATED HYBRID DRIVER IN FORWARD LCA 3 PROVIDES POWER TO THE CONTROL LOGIC CIRCUIT OF THE S-BAND ANTENNA SWITCH ASSY AND SWITCH BEAM CONTROL ASSY (SBCA). FAILURE OF THIS DEDICATED HYBRID DRIVER RESULTS IN LOSS OF ONE OF THE LOGIC CIRCUITS CONTROLLING QUAD ANTENNA SELECTION SBCA. SUBSEQUENT FAILURE OF THE REDUNDANT DEDICATED HYBRID DRIVER RESULTS IN LOSS OF ANTENNA SWITCHING CAPABILITY, EITHER BY GPC OR PANEL CONTROL. LOSS OF MISSION COULD RESULT IF QUAD ANTENNA CONTROL IS LOST.

REFERENCES: VS70-740259, SPACE SHUTTLE SYSTEMS HANDBOOK

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 1592 ABORT: 3/3

ITEM: HYBRID DRIVER, TYPE III, A17(J4-117)  
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) ANTENNA SWITCH ASSY & SBCA PANEL MODE POWER CONTROL CIRCUIT
- 4) FORWARD LOAD CONTROL ASSY (LCA) 2
- 5) HYBRID DRIVER, TYPE III, A17(J4-117)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 82V76A17ARIII(J4-117)  
PART NUMBER: MC477-0263-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS DEDICATED HYBRID DRIVER IN FORWARD LCA 2 PROVIDES POWER TO THE CONTROL LOGIC CIRCUIT OF THE S-BAND ANTENNA SWITCH ASSY AND SWITCH BEAM CONTROL ASSY (SBCA)  
INADVERTENT OUTPUT OF THIS HYBRID DRIVER RESULTS IN LOSS OF ABILITY TO TURN OFF THAT CONTROL LOGIC CIRCUIT. FAILURE OF BOTH CONTROL LOGIC CIRCUITS COULD RESULT IN CONTINUOUS UNINTENTIONAL POWER CONSUMPTION.  
THE UNINTENTIONAL POWER CONSUMPTION IN ITSELF WOULD NOT CAUSE LOSS OF MISSION OR ENDANGER CREW/VEHICLE.

REFERENCES: VS70-740259, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 1593 ABORT: 3/3

ITEM: HYBRID DRIVER, TYPE III, A18(J4-117)  
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) ANTENNA SWITCH ASSY & SBCA PANEL MODE POWER CONTROL CIRCUIT
- 4) FORWARD LOAD CONTROL ASSY (LCA) 3
- 5) HYBRID DRIVER, TYPE III, A18(J4-117)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 82V76A17ARIII(J4-117)  
PART NUMBER: MC477-0263-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS DEDICATED HYBRID DRIVER IN FORWARD LCA 3 PROVIDES POWER TO THE CONTROL LOGIC CIRCUIT OF THE S-BAND ANTENNA SWITCH ASSY AND SWITCH BEAM CONTROL ASSY (SBCA). INADVERTENT OUTPUT OF THIS HYBRID DRIVER RESULTS IN LOSS OF ABILITY TO TURN OFF THAT CONTROL LOGIC CIRCUIT. FAILURE OF BOTH CONTROL LOGIC CIRCUITS COULD RESULT IN CONTINUOUS UNINTENTIONAL POWER CONSUMPTION.

THE UNINTENTIONAL POWER CONSUMPTION IN ITSELF WOULD NOT CAUSE LOSS OF MISSION OR ENDANGER CREW/VEHICLE.

REFERENCES: VS70-740259, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1594 ABORT: 3/2R

ITEM: FUSE, 5 AMP, A17(J4-117)  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) ANTENNA SWITCH ASSY & SBCA PANEL MODE POWER CONTROL CIRCUIT
- 4) FORWARD LOAD CONTROL ASSY (LCA) 2
- 5) FUSE, 5 AMP, A17(J4-117)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: 36V76A17(J4-117)  
PART NUMBER: ME451-0010-0121

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS FUSE IN FORWARD LCA 2 PROVIDES OVERCURRENT PROTECTION TO ONE  
OF THE REDUNDANT S-BAND ANTENNA SWITCH ASSY AND SWITCH BEAM  
CONTROL ASSEMBLY (SBCA) POWER CIRCUITS.  
FAILURE OF THIS FUSE RESULTS IN LOSS OF ONE OF THE REDUNDANT S-  
BAND ANTENNA SWITCH ASSY AND SBCA POWER CONTROL CIRCUITS.  
ANTENNA SWITCHING CAPABILITY IS LOST WITH FAILURE OF BOTH FUSES.  
LOSS OF QUAD ANTENNA CONTROL COULD RESULT IN MISSION LOSS.

REFERENCES: VS70-740259, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1595 ABORT: 3/2R

ITEM: FUSE, 5 AMP, A18(J4-117)  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) ANTENNA SWITCH ASSY & SBCA PANEL MODE POWER CONTROL CIRCUIT
- 4) FORWARD LOAD CONTROL ASSY (LCA) 3
- 5) FUSE, 5 AMP, A18(J4-117)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 36V76A18(J4-117)  
PART NUMBER: ME451-0010-0121

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS FUSE IN FORWARD LCA 3 PROVIDES OVERCURRENT PROTECTION TO ONE  
OF THE REDUNDANT S-BAND ANTENNA SWITCH ASSY AND SWITCH BEAM  
CONTROL ASSEMBLY (SBCA) POWER CIRCUITS.  
FAILURE OF THIS FUSE RESULTS IN LOSS OF ONE OF THE REDUNDANT S-  
BAND ANTENNA SWITCH ASSY AND SBCA POWER CONTROL CIRCUITS.  
ANTENNA SWITCHING CAPABILITY IS LOST WITH FAILURE OF BOTH FUSES.  
LOSS OF QUAD ANTENNA CONTROL COULD RESULT IN MISSION LOSS.

REFERENCES: VS70-740259, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1596 ABORT: 3/2R

ITEM: SWITCH, 2-POLE, 3-POS, A2S5  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) ANTENNA SWITCH ASSY & SBCA PANEL MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) SWITCH, 2-POLE, 3-POS, A2S5
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: 36V73A1A2S5  
PART NUMBER: ME452-0102-7203

CAUSES: MISHANDLING, MECHANICAL/STRUCTURAL MALFUNCTION,  
SHOCK/VIBRATION, CONTAMINATION/CORROSION/DETERIORATION,  
TEMPERATURE LIMITS EXCEEDED.

EFFECTS/RATIONALE:

SWITCH S5 ON PANEL A1A2 PROVIDES THE CAPABILITY TO TURN ON EITHER OF THE REDUNDANT SETS OF S-BAND ANTENNA SWITCH ASSY AND SBCA POWER CIRCUITS WHEN THE GCIL IS IN THE PANEL MODE. FAILURE OF S5 RESULTS IN LOSS OF REDUNDANCY IN THE S-BAND ANTENNA SWITCH AND SBCA POWER CONTROL CIRCUITS WHEN THE GCIL IS IN THE PANEL MODE. SUBSEQUENT FAILURE OF THE GCIL COULD RESULT IN LOSS OF CONTROL OF QUAD ANTENNA SWITCHING AND MISSION LOSS.

REFERENCES: VS70-740259, VS70-740299, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1597 ABORT: 3/2R

ITEM: SWITCH, 2-POLE, 3-POS, A2S5  
FAILURE MODE: FAILS SHORTED, FAILS CLOSED

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) ANTENNA SWITCH ASSY & SBCA PANEL MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) SWITCH, 2-POLE, 3-POS, A2S5
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 36V73A1A2S5  
PART NUMBER: ME452-0102-7203

CAUSES: MISHANDLING, MECHANICAL/STRUCTURAL MALFUNCTION,  
SHOCK/VIBRATION, CONTAMINATION/CORROSION/DETERIORATION,  
TEMPERATURE LIMITS EXCEEDED.

EFFECTS/RATIONALE:

SWITCH S5 ON PANEL A1A2 PROVIDES THE CAPABILITY TO TURN ON EITHER OF THE REDUNDANT SETS OF S-BAND ANTENNA SWITCH ASSY AND SBCA CONTROL CIRCUITS WHEN THE GCIL IS IN THE PANEL MODE. S5 FAILED SHORTED RESULTS IN LOSS OF ABILITY TO POWER DOWN THE SELECTED CONTROL LOGIC CIRCUIT IN THE PANEL MODE. SUBSEQUENT FAILURE IN ASSOCIATED ANTENNA CONTROL ELECTONICS COULD PREVENT ANTENNA SELECTION IN PANEL MODE. FAILURE COULD BE COMPENSATED FOR BY SELECTING COMMAND MODE. LOSS OF ALL CAPABILITY TO CONTROL ANTENNA SELECTION BY EITHER PANEL CONTROL OR BY GPC COULD CAUSE MISSION LOSS BECAUSE OF ATTITUDE CONSTRAINTS REQUIRED TO MAINTAIN S-BAND PM COMM.

REFERENCES: VS70-740259, VS70-740299, SPACE SHUTTLE SYSTEMS HANDBOOK

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1598 ABORT: 3/2R

ITEM: DIODE, A19CR1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) ANTENNA SWITCH ASSY & SBCA PANEL MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) DIODE, A19CR1
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: 36V73A1A2A19CR1  
PART NUMBER: JANTXV1N4146

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

DIODE CR1 PROTECTS THE GCIL DRIVER FROM SWITCH SHORTS. AN OPEN  
CIRCUIT FAILURE OF CR1 WOULD CAUSE LOSS OF REDUNDANT CONTROL  
LOGIC CIRCUIT.

A SUBSEQUENT OPEN FAILURE OF CR2 WOULD RESULT IN LOSS OF PANEL  
CONTROL FUNCTION.

SUBSEQUENT LOSS OF GCIL COMMAND MODE CONTROL COULD RESULT IN LOSS  
OF MISSION.

REFERENCES: VS70-740259, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87  
SUBSYSTEM: C&T/EPD&C/S-BAND  
MDAC ID: 1599

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 3/2R

ITEM: DIODE, A19CR2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) ANTENNA SWITCH ASSY & SBCA PANEL MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) DIODE, A19CR2
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 36V73A1A2A19CR2  
PART NUMBER: JANTXV1N4146

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

DIODE CR2 PROTECTS THE GCIL DRIVER FROM SWITCH SHORTS.  
A SUBSEQUENT FAILURE OF ANALOGOUS DIODE CR1 WOULD RESULT IN LOSS  
OF PANEL CONTROL FUNCTION.  
SUBSEQUENT LOSS OF GCIL COMMAND MODE CONTROL COULD RESULT IN LOSS  
OF MISSION.

REFERENCES: VS70-740259, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87  
SUBSYSTEM: C&T/EPD&C/S-BAND  
MDAC ID: 1600

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: DIODE, A19CR1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: W.W. ROBINSON

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) ANTENNA SWITCH ASSY & SBCA PANEL MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) DIODE, A19CR1
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A1A2A19CR1  
PART NUMBER: JANTXV1N4146

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

DIODE CR1 PROTECTS THE GCIL DRIVER FROM SWITCH SHORTS. SHORTED  
DIODE CR1 WOULD NOT AFFECT MISSION OR CREW/VEHICLE.

REFERENCES: VS70-740259, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87  
SUBSYSTEM: C&T/EPD&C/S-BAND  
MDAC ID: 1601

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: DIODE, CR2A19  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: W.W. ROBINSON

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) ANTENNA SWITCH ASSY & SBCA PANEL MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) DIODE, A19CR2
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A1A2A19CR2  
PART NUMBER: JANTXV1N4146

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

DIODE CR2 PROTECTS THE GCIL DRIVER FROM SWITCH SHORTS. SHORTED  
DIODE CR1 WOULD NOT AFFECT MISSION OR CREW/VEHICLE.

REFERENCES: VS70-740259, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1602 ABORT: 3/2R

ITEM: RESISTOR, 1.2K OHM, 2W, A19R1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) ANTENNA SWITCH ASSY & SBCA PANEL MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) RESISTOR, 1.2K OHM, 2W, A19R1
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: 36V73A1A2A19R1  
PART NUMBER: RWR80S1211BR

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

CURRENT LIMITING RESISTOR R1 PROTECTS THE S-BAND ANTENNA SWITCH ASSY AND SBCA POWER CONTROL CIRCUIT WIRING FROM CURRENT OVERLOADS WHEN THE GCIL IS IN THE PANEL MODE.  
RESISTOR R1 FAILING OPEN RESULTS IN LOSS OF ABILITY TO POWER UP THE ASSOCIATED SWITCH ASSY AND SBCA WHEN THE GCIL IS IN THE PANEL MODE. SUBSEQUENT FAILURE OF RESISTOR R2 (IOA 1297) WOULD CAUSE LOSS OF THE ANTENNA SWITCHING FUNCTION.  
SUBSEQUENT GCIL LOSS WOULD CAUSE LOSS OF ALL CAPABILITY TO CONTROL QUAD ANTENNA SELECTION AND COULD CAUSE LOSS OF MISSION OBJECTIVES.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1603 ABORT: 3/2R

ITEM: RESISTOR, 1.2K OHM, 2W, A19R2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) ANTENNA SWITCH ASSY & SBCA PANEL MODE POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) RESISTOR, 1.2K OHM, 2W, A19R2
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 36V73A1A2A19R2  
PART NUMBER: RWR80S1211BR

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

CURRENT LIMITING RESISTOR R2 PROTECTS THE S-BAND ANTENNA SWITCH ASSY AND SBCA POWER CONTROL CIRCUIT WIRING FROM CURRENT OVERLOADS WHEN THE GCIL IS IN THE PANEL MODE. RESISTOR R2 FAILING OPEN RESULTS IN LOSS OF ABILITY TO POWER UP THE ASSOCIATED SWITCH ASSY AND SBCA WHEN THE GCIL IS IN THE PANEL MODE. SUBSEQUENT FAILURE OF RESISTOR R1 (IOA 1296) WOULD CAUSE LOSS OF THE ANTENNA SWITCHING FUNCTION. SUBSEQUENT GCIL LOSS WOULD CAUSE LOSS OF ALL CAPABILITY TO CONTROL QUAD ANTENNA SELECTION AND COULD CAUSE LOSS OF MISSION OBJECTIVES.

REFERENCES: VS70-740139, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/2R  
MDAC ID: 1604 ABORT: 3/2R

ITEM: FUSE, 1AMP, A2F5  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND PM/FM
- 3) ANTENNA SWITCH ASSY & SBCA GROUND COMMAND POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) FUSE, 1 AMP, A2F5
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: 36V73A1A2F5  
PART NUMBER: ME451-0018-0100

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

FUSE F5 ON PANEL A1A2 PROTECTS THE S-BAND ANTENNA SWITCH ASSY AND SWITCH BEAM CONTROL ASSY (SBCA) ELECTRONICS GROUND COMMAND POWER CONTROL CIRCUIT FROM OVERCURRENT FAILURES.

FAILURE OF FUSE F5 WOULD RESULT IN LOSS OF POWER TO THE S-BAND ANTENNA SWITCH ASSY AND SBCA.

SUBSEQUENT LOSS OF FUSE F12 WOULD RESULT IN LOSS OF GROUND COMMAND SWITCHING CAPABILITY. LOSS OF ALL CAPABILITY TO CONTROL ANTENNA SELECTION EITHER BY GPC CONTROL OR MANUALLY COULD IMPOSE VEHICLE ATTITUDE CONSTRAINTS CAUSING LOSS OF MISSION OBJECTIVES.

REFERENCES: VS70-740259, VS70-740299, SPACE SHUTTLE SYSTEMS HANDBOOK

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87  
SUBSYSTEM: C&T/EPD&C/S-BAND  
MDAC ID: 1605

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 3/2R

ITEM: FUSE, 1AMP, A2F12  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) ANTENNA SWITCH ASSY & SBCA GROUND COMMAND POWER CONTROL CIRCUIT
- 4) PANEL A1A2
- 5) FUSE, 1 AMP, A2F12
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: 36V73A1A2F12  
PART NUMBER: ME451-0018-0100

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

FUSE F12 ON PANEL A1A2 PROTECTS THE S-BAND ANTENNA SWITCH ASSY AND SWITCH BEAM CONTROL ASSY (SBCA) ELECTRONICS GROUND COMMAND POWER CONTROL CIRCUIT FROM OVERCURRENT FAILURES. FAILURE OF FUSE F12 WOULD RESULT IN LOSS OF POWER TO THE S-BAND ANTENNA SWITCH ASSY AND SBCA. SUBSEQUENT LOSS OF FUSE F5 WOULD RESULT IN LOSS OF GROUND COMMAND SWITCHING CAPABILITY. LOSS OF ALL CAPABILITY TO CONTROL ANTENNA SELECTION EITHER BY GPC CONTROL OR MANUALLY COULD IMPOSE VEHICLE ATTITUDE CONSTRAINTS CAUSING LOSS OF MISSION OBJECTIVES.

REFERENCES: VS70-740259, VS70-740299, SPACE SHUTTLE SYSTEMS HANDBOOK

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1606 ABORT: 3/1R

ITEM: FUSE, 1A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) CNTLBC1 BUS
- 3) 1A FUSE F9
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/1R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/1R	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE-PART STRUCTURAL  
FAILURE, VIBRATION, MECHANICAL SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

RESULTS IN LOSS OF GCIL CMD PWR CONTROLLING NSP1 PWR ON. PANEL SW CONTROL REMAINS ACTIVE. FAILURE DISABLES ALL GCIL/PNL SW CONTROL OF NSP1 SYS CONFIG & ENCRYPTION CONFIG USING COMSEC 1. FULL FUNCTIONAL REDUNDANCY PROVIDED BY PARALLEL CKT SUPPLYING 28VDC TO CONTROL NSP2 & COMSEC 2. FAILURE ALSO RESULTS IN LOSS OF 28VDC (NSP1 ON) TO: S-BAND PM MODE SW & GCIL CMD PWR DISABLING PNL SW/GCIL CONTROL OF THE S-BAND RL DATA ENABLE SIGNAL XPONDER 1 & 2; DATA SOURCE SELECTOR (RL OPS DATA) IN THE KU-BAND SIG PROC; PILOT & MISSION SPECIALIST AUDIO PNL (SYS CONFIG CONTROL BITS FOR AG1 & AG2 COMM); &, UPLINK BLOCK PNL SWITCH (DISABLES NSP1 INHIBIT CMD). SINGLE FAILURE WOULD HAVE NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1607 ABORT: 3/1R

ITEM: FUSE, 1A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) CNTLBC2 BUS
- 3) 1A FUSE F16
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE-PART STRUCTURAL  
FAILURE, VIBRATION, MECHANICAL SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

RESULTS IN LOSS OF GCIL CMD PWR CONTROLLING NSP2 PWR ON. PNL SW CONTROL REMAINS ACTIVE. FAILURE DISABLES ALL GCIL/PNL SW CONTROL OF NSP2 SYS CONFIG & ENCRYPTION CONFIG USING COMSEC 2. PNL SW CONTROL REMAINS FOR BOTH NSPS PWR ON. FAILURE ALSO RESULTS IN LOSS OF 28VDC (NSPS ON) TO : S-BAND PM MODE SW & GCIL CMD PWR DISABLING PNL SW/GCIL CONTROL OF S-BAND RL DATA ENABLE SIGNAL TO XPONDER 1 & 2; SELECT OF RL OPS IN THE KU-BAND SIG PROC; PLT & MS AUDIO PNL SYS CONFIG CONTROL BITS FOR AG1 & AG2 COMM; & UPLINK BLOCK PNL SW (DISABLES NSP2 INHIBIT CMD). LOSS OF CKT REDUNDANCY RESULTS IN LOSS OF S-BAND COMM & LOSS OF MISSION. LOSS OF ALL REDUNDANCY (S-BAND, KU-BAND, UHF) DISABLES STATE VECTOR UPDATE CAPABILITIES WHICH COULD RESULT IN LOSS OF CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

REPORT DATE 12/31/87 C-178

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1608 ABORT: 3/1R

ITEM: RESISTOR, 1.2K  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) CNTBC1 BUS
- 3) 1.2K RESISTOR A14R2
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

RESULTS IN LOSS OF PNL SWITCH CONTROL OF NSP1 PWR ON. GCIL CONTROL OF NSP1 REMAINS ACTIVE. FAILURE DISABLES ALL GCIL/PNL SW CONTROL OF NSP1 SYS CONFIG AND ENCRYPTION CONFIG USING COMSEC 1. FULL FUNCTIONAL REDUNDANCY PROVIDED BY PNL SWITCH/GCIL PWR ON CONTROL OF NSP2 & COMSEC 2. FAILURE ALSO RESULTS IN LOSS OF 28VDC (NSP1 ON) TO: S-BAND PM MODE SW & GCIL CMD PWR DISABLING PNL SW/BCIL CONTROL OF THE S-BAND RL DATA ENABLE SIGNAL TO XPONDER 1 & 2; DATA SOURCE SELECTOR (RL OPS DATA) IN THE KU-BAND SIG PROC; PLT & MS AUDIO PNL (SYS CONFIG CONTROL BITS FOR AG1 & AG2 COMM); AND, UPLINK BLOCK PNL SW (DISABLES NSP1 INHIBIT CMD). SINGLE FAILURE WOULD HAVE NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1609 ABORT: 3/1R

ITEM: RESISTOR, 1.2K  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) CNTLBC2 BUS
- 3) 1.2K RESISTOR A14R1
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECHANICAL SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

RESULTS IN LOSS OF PNL SWITCH CONTROL OF NSP2 PWR ON. GCIL CONTROL OF NSP2 REMAINS ACTIVE. FAILURE DISABLES ALL GCIL/PNL SW CONTROL OF NSP2 SYS CONFIG & ENCRYPTION CONFIG USING COMSEC 2. FAILURE ALSO RESULTS IN LOSS OF 28VDC (NSP2 ON) TO: S-BAND PM MODE SW & GCIL CMD PWR DISABLING PNL SW/GCIL CONTROL OF THE S-BAND RL DATA ENABLE SIGNAL TO XPONDER 1 & 2; DATA SOURCE SELECTOR (RL OPS DATA) IN THE KU-BAND SIG PROC; PLT & MS AUDIO PNL (SYS CONFIG CONTROL BITS FOR AG1 & AG2 COMM); &, UPLINK BLOCK PNL SW (DISABLES NSP2 INHIBIT CMD). LOSS OF ALL REDUNDANCY RESULTS IN LOSS OF S-BAND COMM & LOSS OF MISSION. LOSS OF ALL REDUNDANCY (S-BAND, KU-BAND, UHF) DISABLES STATE VECTOR UPDATE CAPABILITIES WHICH COULD RESULT IN LOSS OF CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1610 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) CNTLBC1 BUS
- 3) 1.2K RESISTOR
- 4) NSP POWER 1/2 ON/OFF SWITCH S23
- 5) DIODE A18CR10
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION:  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

RESULTS IN LOSS OF PNL SW CONTROL OF NSP1 PWR ON. GCIL CONTROL OF NSP1 REMAINS ACTIVE. FAILURE DISABLES ALL GCIL/PNL SW CONTROL OF NSP1 SYS CONFIG & ENCRYPTION CONFIG USING COMSEC 1. FULL FUNCTIONAL REDUNDANCY PROVIDED BY PNL SW/GCIL PWR ON CONTROL OF NSP2 AND COMSEC 2. FAILURE ALSO RESULTS IN LOSS OF 28VDC (NSP1 ON) TO: S-BAND PM MODE SW & GCIL CMD PWR DISABLING PNL SW/GCIL CONTROL OF THE S-BAND RL DATA ENABLE SIGNAL TO XPONDER 1 & 2; DATA SOURCE SELECTOR (RL OPS DATA) IN THE KU-BAND SIG PROC; PLT & MS AUDIO PNL (SYS CONFIG CONTROL BITS FOR AG1 & AG2 COMM); &, UPLINK BLOCK PNL SW (DISABLES NSP1 INHIBIT CMD). SINGLE FAILURE WOULD HAVE NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C , FLIGHT: 3/3  
MDAC ID: 1611 ABORT: 3/3

ITEM: DIODE  
FAILURE MODE: FAILS SHORT

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) DIODE A18CR10
- 3)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES	
FLIGHT PHASE	HDW/FUNC	ABORT
PRELAUNCH:	3/3	RTLS: 3/3
LIFTOFF:	3/3	TAL: 3/3
ONORBIT:	3/3	AOA: 3/3
DEORBIT:	3/3	ATO: 3/3
LANDING/SAFING:	3/3	

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:  
SINGLE FAILURE WOULD HAVE NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1612 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) CNTLBC2 BUS
- 3) 1.2K RESISTOR
- 4) NSP POWER 1/2 ON/OFF SWITCH S23
- 5) DIODE A18CR9
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

RESULTS IN LOSS OF PNL SW CONTROL OF NSP2 PWR ON. GCIL CONTROL OF NSP2 REMAINS ACTIVE. FAILURE DISABLES ALL GCIL/PNL SWITCH CONTROL OF NSP2 SYS CONFIG & ENCRYPTION CONFIG USING COMSEC 2. FAILURE ALSO RESULTS IN LOSS OF 28VDC (NSP2 ON) TO: S-BAND PM MODE SW & GCIL CMD PWR DISABLING PNL SW/GCIL CONTROL OF THE S-BAND RL DATA ENABLE SIG TO XPONDER 1 & 2; DATA SOURCE SELECTOR (RL OPS DATA) IN THE KU-BAND SIG PROC; PLT & MS AUDIO PNL (SYS CONFIG CONTROL BITS FOR AG1 & AG2 COMM) &, UPLINK BLOCK PNL SW (DISABLES NSP2 INHIBIT CMD). LOSS OF ALL REDUNDANCY RESULTS IN LOSS OF S-BAND COMM & LOSS OF MISSION. LOSS OF ALL REDUNDANCY (S-BAND, KUBAND, UHF) DISABLES STATE VECTOR UPDATE CAPABILITIES WHICH COULD RESULT IN LOSS OF CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/10/87  
SUBSYSTEM: COMM AND TRACK/EPD&C  
MDAC ID: 1613

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: DIODE  
FAILURE MODE: FAILS SHORT

LEAD ANALYST: E.S. DALEY

SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) DIODE A18CR9
- 3)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:  
SINGLE FAILURE WOULD HAVE NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1614 ABORT: 3/2R

ITEM: RESISTOR, 1.2K  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, COMSEC 1/2
- 2) CNTLAB3 BUS
- 3) 1.2K RESISTOR A11R1
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF ONE SOURCE OF 28VDC USED TO PWR ON COMSEC 1 AND 2.  
SINGLE FAILURE WOULD HAVE NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1615 ABORT: 3/2R

ITEM: RESISTOR, 1.2K  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, COMSEC 1/2
- 2) CNTLAB1 BUS
- 3) 1.2K RESISTOR A11R2
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF THE REDUNDANT PWR SUPPLY FOR COMSEC 1 AND 2. LOSS OF ALL  
REDUNDANCY DISABLES ENCRYPTION CAPABILITIES AND WOULD LIKELY  
CAUSE LOSS OF A MISSION REQUIRING SECURE COMMUNICATIONS.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1616 ABORT: 3/2R

ITEM: RPC  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, COMSEC 1/2
- 2) MNA FPC1 BUS
- 3) RPC 46
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FWD PWR CONT ASSY 1  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF ONE SOURCE OF 28VDC USED TO POWER ON COMSEC 1.  
REDUNDANCY PROVIDED BY PARALLEL RPC. SINGLE FAILURE WOULD HAVE  
NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 1617 ABORT: 3/3

ITEM: RPC  
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, COMSEC 1/2
- 2) MNA FPC1 BUS
- 3) RPC 46
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES	
	HDW/FUNC	ABORT
PRELAUNCH:	3/3	RTLS: 3/3
LIFTOFF:	3/3	TAL: 3/3
ONORBIT:	3/3	AOA: 3/3
DEORBIT:	3/3	ATO: 3/3
LANDING/SAFING:	3/3	

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD PWR CONT ASSY 1  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:  
WOULD MAINTAIN 28VDC PWR SUPPLY TO COMSEC 1. FAILURE WOULD HAVE  
NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1618 ABORT: 3/2R

ITEM: RPC  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, COMSEC 1/2
- 2) MNBFP2 BUS
- 3) RPC 47
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FWD PWR CONT ASSY 2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF REDUNDANT SOURCE OF 28VDC USED TO PWR ON COMSEC 1.  
REDUNDANCY REMAINS TO PWR COMSEC 2. LOSS OF ALL REDUNDANCY  
DISABLES ENCRYPTION CAPABILITIES AND WOULD LIKELY CAUSE LOSS OF A  
MISSION REQUIRING SECURE COMMUNICATIONS.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 1619 ABORT: 3/3

ITEM: RPC  
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, COMSEC 1/2
- 2) MNB FPC2 BUS
- 3) RPC 47
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD PWR CONT ASSY 2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

WOULD MAINTAIN 28VDC PWR SUPPLY TO COMSEC 1. FAILURE WOULD HAVE  
NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/24/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1620 ABORT: 3/2R

ITEM: RPC  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, COMSEC 1/2
- 2) MNA FPC 1 BUS
- 3) RPC 45
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FWD PWR CONT ASSY 1  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECHANICAL SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF ONE SOURCE OF 28VDC TO PWR ON COMSEC 2. REDUNDANCY BY  
PARALLEL RPC. SINGLE FAILURE WOULD HAVE NO EFFECT ON  
MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/24/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 1621 ABORT: 3/3

ITEM: RPC  
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, COMSEC 1/2
- 2) MNA FCP 1 BUS
- 3) RPC 45
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD PWR CONT ASSY 1  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:  
WOULD MAINTAIN 28VDC PWR SUPPLY TO COMSEC 2. FAILURE WOULD HAVE  
NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/24/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1622 ABORT: 3/2R

ITEM: RPC  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, COMSEC 1/2
- 2) MNB FPC2 BUS
- 3) RPC 48
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FWD PWR CONT ASSY 2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF REDUNDANT SOURCE OF 28VDC USED TO PWR ON COMSEC 2. LOSS  
OF ALL REDUNDANCY DISABLES ENCRYPTION CAPABILITIES AND WOULD  
LIKELY CAUSE LOSS OF A MISSION REQUIRING SECURE COMMUNICATIONS.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/24/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 1623 ABORT: 3/3

ITEM: RPC  
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, COMSEC 1/2
- 2) MNB FPC2 BUS
- 3) RPC 48
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES	
FLIGHT PHASE	HDW/FUNC	ABORT
PRELAUNCH:	3/3	RTLS: 3/3
LIFTOFF:	3/3	TAL: 3/3
ONORBIT:	3/3	AOA: 3/3
DEORBIT:	3/3	ATO: 3/3
LANDING/SAFING:	3/3	

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD PWR CONT ASSY 2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

WOULD MAINTAIN 28VDC PWR SUPPLY TO COMSEC 2. FAILURE WOULD HAVE  
NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/24/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1624 ABORT: 3/2R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, COMSEC 1/2
- 2) MNB FPC2 BUS
- 3) RPC 47
- 4) DIODE CR16
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FWD PWR CONT ASSY 2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECHANICAL SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF ONE SOURCE OF 28VDC USED TO PWR ON COMSEC 1. REDUNDANCY  
PROVIDED BY PARALLEL DIODE. SINGLE FAILURE WOULD HAVE NO EFFECT  
ON MISSION/CREW/VEHICLE.

REFERENCES: SSH 16.3, SYST SCHEM VS70-740229

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/24/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1625 ABORT: 3/2R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, COMSEC 1/2
- 2) MNB FPC1 BUS
- 3) RPC 46
- 4) DIODE CR40
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FWD PWR CONT ASSY 2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF REDUNDANT SOURCE OF 28VDC USED TO PWR ON COMSEC 1.  
REDUNDANCY REMAINS TO PWR COMSEC 2. LOSS OF ALL REDUNDANCY  
DISABLES ENCRYPTION CAPABILITIES AND WOULD LIKELY CAUSE LOSS OF A  
MISSION REQUIRING SECURE COMMUNICATIONS.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/24/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1626 ABORT: 3/2R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, COMSEC 1/2
- 2) MNB FPC2 BUS
- 3) RPC 48
- 4) DIODE CR17
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FWD PWR CONT ASSY 2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF ONE SOURCE OF 28VDC TO PWR ON COMSEC 2. REDUNDANCY  
PROVIDED BY PARALLEL DIODE. SINGLE FAILURE WOULD HAVE NO EFFECT  
ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/24/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1627 ABORT: 3/2R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, COMSEC 1/2
- 2) MNA FPC1 BUS
- 3) RPC 45
- 4) DIODE CR 46
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FWD PWR CONT ASSY 2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF REDUNDANT SOURCE OF 28VDC USED TO PWR ON COMSEC 2. LOSS  
OF ALL REDUNDANCY DISABLES ENCRYPTION CAPABILITIES AND WOULD  
LIKELY CAUSE LOSS OF A MISSION REQUIRING SECURE COMMUNICATIONS.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 1628 ABORT: 3/3

ITEM: DIODE(S)  
FAILURE MODE: FAILS SHORT

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, COMSEC 1/2
- 2) DIODES CR 16, 17, 40, 46
- 3)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD PWR CONT ASSY 2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:  
SINGLE FAILURE WOULD HAVE NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEMATIC VS70-740229

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/07/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1629 ABORT: 3/1R

ITEM: FUSE, 3A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) MNBFLC2 BUS
- 3) 3A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 2  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE-PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

RESULTS IN LOSS OF PWR SOURCE TO DRIVER SUPPLYING 28VDC TO PNL  
SWITCHES AND GCIL CMD PWR CONTROLLING NSP1 SYS CONFIG &  
ENCRYPTION CONFIG OF COMSEC 1. FAILURE ALSO RESULTS IN LOSS OF  
28VDC (NSP1 ON) TO: S-BAND PM MODE SWITCH & GCIL CMD PWR  
DISABLING PNL SW/GCIL CONTROL OF THE S-BAND RL DATA ENABLE SIGNAL  
TO XPONDER 1 & 2; DATA SOURCE SELECTOR (RL OPS DATA) IN THE KU-  
BAND SIG PROC; PLT & MS AUDIO PNL (SYS CONFIG CONTROL BITS FOR  
AG1 & AG2 COMM); &, UPLINK BLOCK PNL SWITCH (DISABLES NSP1  
INHIBIT CMD). REDUNDANCY PROVIDED BY PARALLEL CKT CONTROLLING  
NSP2 AND COMSEC 2. SINGLE FAILURE WOULD HAVE NO EFFECT ON  
MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/07/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1630 ABORT: 3/1R

ITEM: FUSE, 3A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) MNCFLC3 BUS
- 3) 3A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/1R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/1R	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 3  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE-PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

RESULTS IN LOSS OF PWR SOURCE TO DRIVER SUPPLYING 28VDC TO PNL  
SWITCHES & GCIL CMD PWR CONTROLLING NSP 2 SYS CONFIG & ENCRYPTION  
CONFIG OF COMSEC 2. FAILURE ALSO RESULTS IN LOSS OF 28VDC (NSP2  
ON) TO : S-BAND PM MODE SWITCH & GCIL CMD PWR DISABLING PNL  
SW/GCIL CONTROL OF THE S-BAND RL DATA ENABLE SIGNAL TO XPONDER 1  
& 2; DATA SOURCE SELECTOR (RL OPS DATA) IN THE KU-BAND SIG PROC;  
PLT & MS AUDIO PNL (SYS CONFIG CONTROL BITS FOR AG1 & AG2 COMM);  
&, UPLINK BLOCK PNL SWITCH (DISABLES NSP2 INHIBIT  
CMD). LOSS OF ALL NSP REDUNDANCY RESULTS IN LOSS OF S-BAND COMM  
& LOSS OF MISSION. LOSS OF ALL REDUNDANCY (S-BAND, KU-BAND, UHF)  
DISABLES STATE VECTOR UPDATE CAPABILITIES WHICH COULD RESULT IN  
LOSS OF CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/07/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1631 ABORT: 3/1R

ITEM: FUSE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) MNBFLC2 BUS
- 3) FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES	
FLIGHT PHASE	HDW/FUNC	ABORT
PRELAUNCH:	3/3	RTLS: 3/3
LIFTOFF:	3/3	TAL: 3/3
ONORBIT:	3/1R	AOA: 3/3
DEORBIT:	3/3	ATO: 3/1R
LANDING/SAFING:	3/3	

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 2  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE-PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

RESULTS IN LOSS OF PWR SOURCE TO DRIVER SUPPLYING 28VDC TO PNL  
SWITCHES CONTROLLING NSP1 SYSTEM CONFIGURATION AND ENCRYPTION  
CONFIGURATION OF COMSEC 1. GCIL CONTROL OF NSP1 CONFIGURATION  
REMAINS INTACT. REDUNDANCY PROVIDED BY PARALLEL CKT CONTROLLING  
NSP2 AND COMSEC 2. SINGLE FAILURE WOULD HAVE NO EFFECT ON  
MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/07/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1632 ABORT: 3/1R

ITEM: FUSE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) MNCFLC3 BUS
- 3) FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 3  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE-PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

RESULTS IN LOSS OF PWR SOURCE TO DRIVER SUPPLYING 28VDC TO PNL  
SWITCHES CONTROLLING NSP2 SYSTEM CONFIGURATION AND ENCRYPTION  
CONFIGURATION OF COMSEC 2. GCIL CONTROL OF NSP2 CONFIGURATION  
REMAINS INTACT. LOSS OF ALL NSP REDUNDANCY RESULT IN LOSS OF  
S-BAND COMMUNICATIONS AND LOSS OF MISSION. LOSS OF ALL REDUNDANCY  
(S-BAND, KU-BAND, UHF) DISABLES STATE VECTOR UPDATE CAPABILITIES  
WHICH COULD RESULT IN LOSS OF CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1633 ABORT: 3/1R

ITEM: DRIVER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) MNBFLC2 BUS
- 3) 3A FUSE
- 4) DRIVER, TYPE ARIII
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

RESULTS IN LOSS OF 28VDC TO PNL SWITCHES AND GCIL CMD PWR CONTROLLING NSP1 SYSTEM CONFIGURATION AND ENCRYPTION CONFIGURATION OF COMSEC 1. FAILURE ALSO RESULTS IN LOSS OF 28VDC (NSP1 ON) TO: S-BAND PM MODE SWITCH AND GCIL CMD PWR DISABLING PNL SW/GCIL CONTROL OF THE S-BAND RL DATA ENABLE SIGNAL TO XPONDER 1 & 2; DATA SOURCE SELECTOR (RL OPS DATA) IN THE KU-BAND SIG PROC; PLT & MS AUDIO PNL (SYS CONF CONTROL BITS FOR AG1 & AG2 COMM); &, UPLINK BLOCK PNL SWITCH (DISABLES NSP1 INHIBIT CMD). REDUNDANCY PROVIDED BY PARALLEL CKT CONTROLLING NSP2 AND COMSEC 2. SINGLE FAILURE WOULD HAVE NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1634 ABORT: 3/1R

ITEM: DRIVER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) MNCFLC3 BUS
- 3) 3A FUSE
- 4) DRIVER, TYPE ARIII
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 3  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

RESULTS IN LOSS OF 28VDC TO PNL SWITCHES AND GCIL CMD PWR CONTROLLING NSP2 SYS CONFIG & ENCRYPTION CONFIG OF COMSEC 2. FAILURE ALSO RESULTS IN LOSS OF 28VDC (NSP2 ON) TO: S-BAND PM MODE SWITCH AND GCIL CMD PWR DISABLING PNL SW/GCIL CONTROL OF THE S-BAND RL DATA ENABLE SIGANL TO XPONDER 1 & 2; DATA SOURCE SELECTOR (RL OPS DATA) IN THE KU-BAND SIG PROC; PLT & MS AUDIO PNL (SYS CONFIG CONTROL BITS FOR AG1 & AG2 COMM); &, UPLINK BLOCK PNL SWITCH (DISABLES NSP2 INHIBIT CMD). LOSS OF ALL NSP REDUNDANCY RESULTS IN LOSS OF S-BAND COMM & LOSS OF MISSION. LOSS OF ALL REDUNDANCY (S-BAND, KU-BAND, UHF) DISABLES STATE VECTOR UPDATE CAPABILITIES WHICH COULD RESULT IN LOSS OF CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1635 ABORT: 3/1R

ITEM: DRIVER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) MNBFLC2 BUS
- 3) FUSE
- 4) DRIVER, TYPE ARI
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

RESULTS IN LOSS OF 28VDC TO PNL SWITCHES CONTROLLING NSP1 SYSTEM  
CONFIGURATION AND ENCRYPTION CONFIGURATION OF COMSEC 1. GCIL  
CONTROL OF NSP1 CONFIGURATION REMAINS INTACT. REDUNDANCY  
PROVIDED BY PARALLEL CKT CONTROLLING NSP2 AND COMSEC 2. SINGLE  
FAILURE WOULD HAVE NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740299

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMMA DN TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1636 ABORT: 3/1R

ITEM: DRIVER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) MNCFLC3 BUS
- 3) FUSE
- 4) DRIVER, TYPE ARI
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 3  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

RESULTS IN LOSS OF 28VDC TO PNL SWITCHES CONTROLLING NSP2 SYSTEM  
CONFIGURATION AND ENCRYPTION CONFIGURATION OF COMSEC 2. GCIL  
CONTROL OF NSP2 CONFIGURATION REMAINS INTACT. LOSS OF ALL NSP  
REDUNDANCY RESULTS IN LOSS OF S-BAND COMMUNICATIONS AND LOSS  
OF MISSION. LOSS OF ALL REDUNDANCY (S-BAND, KU-BAND, UHF)  
DISABLES STATE VECTOR UPDATE CAPABILITIES WHICH COULD RESULT IN  
LOSS OF CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

REPORT DATE 12/31/87 C-207

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1637 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP POWER SWITCH S23
- 3) DRIVER, TYPE ARIII
- 4) DIODE
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 3  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

RESULTS IN LOSS OF 28VDC GCIL CMD PWR CONTROLLING NSP1 SYSTEM  
CONFIGURATION. PNL SWITCH CONTROL OF NSP1 CONFIG REMAINS INTACT.  
FULL FUNCTIONAL REDUNDANCY PROVIDED BY PARALLEL CKT CONTROLLING  
NSP2. SINGLE FAILURE WOULD HAVE NO EFFECT ON MISSION/CREW/  
VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1638 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP POWER SWITCH S23
- 3) DRIVER, TYPE ARIII
- 4) DIODE
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 3  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

RESULTS IN LOSS OF 28VDC GCIL CMD PWR CONTROLLING NSP2 SYSTEM  
CONFIGURATION. PNL SWITCH CONTROL OF NSP2 CONFIG REMAINS INTACT.  
LOSS OF ALL NSP REDUNDANCY (GCIL AND PNL SWITCH CONTROL) RESULTS  
IN LOSS OF S-BAND COMMUNICATIONS AND LOSS OF MISSION. LOSS  
OF ALL REDUNDANCY (S-BAND, KU-BAND, UHF) DISABLES STATE VECTOR  
UPDATE CAPABILITIES WHICH COULD RESULT IN LOSS OF CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1639 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP UPLINK DATA SELECT SWITCH S20
- 3) DIODE A17CR1
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC PNL SWITCH CONTROL OF S-BAND UPLINK DATA SOURCE  
SELECTION SIGNAL TO NSP1 MODE CONTROL. GCIL CONTROL OF NSP1 DATA  
SOURCE SELECTION REMAINS INTACT. FULL FUNCTIONAL REDUNDANCY  
PROVIDED BY PARALLEL CKT CONTROLLING NSP2. SINGLE FAILURE WOULD  
HAVE NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1640 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP UPLINK DATA SELECT SWITCH S20
- 3) DIODE A17CR3
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC PNL SWITCH CONTROL OF S-BAND UPLINK DATA SOURCE  
SELECTION SIGNAL TO NSP2 MODE CONTROL. GCIL CONTROL OF NSP2 DATA  
SOURCE SELECTION REMAINS INTACT. LOSS OF ALL S-BAND UPLINK DATA  
SOURCE SELECTION REDUNDANCY WOULD RESTRICT UPLINK TO KU-BAND.  
LOSS OF S-BAND/KUBAND UPLINK DATA SOURCE SELECTION COULD RESULT  
IN LOSS OF MISSION. LOSS OF ALL REDUNDANCY (S-BAND, KU-BAND,  
UHF) DISABLES STATE VECTOR UPDATE CAPABILITIES WHICH COULD RESULT  
IN LOSS OF CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1641 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP UPLINK DATA SELECT SWITCH S20
- 3) DIODE A17CR2
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE,  
VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC PNL SWITCH CONTROL OF KU-BAND UPLINK DATA SOURCE  
SIGNAL TO NSP1 MODE CONTROL. GCIL CONTROL OF NSP1 DATA SOURCE  
SELECTION REMAINS INTACT. FULL FUNCTIONAL REDUNDANCY PROVIDED BY  
PARALLEL CKT CONTROLLING NSP2. SINGLE FAILURE WOULD HAVE NO  
EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1642 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP UPLINK DATA SELECT SWITCH S20
- 3) DIODE A17CR4
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANE; A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC PNL SWITCH CONTROL OF KU-BAND UPLINK DATA SOURCE  
SELECTION SIGNAL TO NSP2 MODE CONTROL. GCIL CONTROL OF NSP2 DATA  
SOURCE SELECTION REMAINS INTACT. LOSS OF ALL KU-BAND UPLINK DATA  
SOURCE SELECTION REDUNDANCY WOULD RESTRICT UPLINK TO  
S-BAND. LOSS OF S-BAND/KU-BAND UPLINK DATA SOURCE SELECTION  
COULD RESULT IN LOSS OF MISSION. LOSS OF ALL REDUNDANCY (S-BAND,  
KU-BAND, UHF) DISABLES STATE VECTOR UPDATE CAPABILITIES WHICH  
COULD RESULT IN LOSS OF CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1643 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP DATA RATE SELECT SWITCH S18
- 3) DIODE A17CR5
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC PNL SWITCH CONTROL OF DOWNLINK HDR SELECTION SIGNAL  
TO NSP1 MODE CONTROL. GCIL CONTROL REMAINS INTACT. FULL  
FUNCTIONAL REDUNDANCY PROVIDED BY PARALLEL CKT CONTROLLING NSP2.  
SINGLE FAILURE WOULD HAVE NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1644 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP DATA RATE SELECT SWITCH S18
- 3) DIODE A17CR7
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC PNL SWITCH CONTROL OF DOWNLINK HDR SELECTION SIGNAL TO NSP2 MODE CONTROL. GCIL CONTROL REMAINS INTACT. LOSS OF ALL HDR TRANSMIT SELECTION REDUNDANCY WOULD RESTRICT TRANSMISSION TO LDR. LOSS OF HDR/LDR SELECTION COULD RESULT IN LOSS OF MISSION. LOSS OF ALL REDUNDANCY (S-BAND, KU-BAND, UHF) DISABLES STATE VECTOR UPDATE CAPABILITIES WHICH COULD RESULT IN LOSS OF CREW/VEHICLE.

REFERENCES: SSSH 16.3, VS70-740229

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1645 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP DATA RATE SELECT SWITCH S18
- 3) DIODE A17CR6
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC PNL SWITCH CONTROL OF DOWNLINK LDR SELECTION SIGNAL  
TO NSP1 MODE CONTROL. GCIL CONTROL REMAINS INTACT. FULL  
FUNCTIONAL REDUNDANCY PROVIDED BY PARALLEL CKT CONTROLLING NSP2.  
SINGLE FAILURE WOULD HAVE NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1646 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP DATA RATE SELECT SWITCH S18
- 3) DIODE A17CR8
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC PNL SWITCH CONTROL OF DOWNLINK LDR SELECTION SIGNAL TO NSP2 MODE CONTROL. GCIL CONTROL REMAINS INTACT. LOSS OF ALL LDR TRANSMIT SELECTION REDUNDANCY WOULD RESTRICT TRANSMISSION TO HDR. LOSS OF HDR/LDR SELECTION COULD RESULT IN LOSS OF MISSION. LOSS OF ALL REDUNDANCY (S-BAND, KU-BAND, UHF) DISABLES STATE VECTOR UPDATE CAPABILITIES WHICH COULD RESULT IN LOSS OF CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1647 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP DATA RATE SELECT SWITCH S19
- 3) DIODE A17CR9
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC PNL SWITCH CONTROL OF UPLINK HDR SELECTION SIGNAL  
TO NSP1 MODE CONTROL. GCIL CONTROL REMAINS INTACT. FULL  
FUNCTIONAL REDUNDANCY PROVIDED BY PARALLEL CKT CONTROLLING NSP2.  
SINGLE FAILURE WOULD HAVE NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740299

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1648 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP DATA RATE SELECT SWITCH S19
- 3) DIODE A17CR11
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC PNL SWITCH CONTROL OF UPLINK HDR SELECTION SIGNAL TO NSP2 MODE CONTROL. GCIL CONTROL REMAINS INTACT. LOSS OF ALL HDR UPLINK SELECTION REDUNDANCY WOULD RESTRICT TRANSMISSION TO LDR. LOSS OF HDR/LDR SELECTION COULD RESULT IN LOSS OF MISSION. LOSS OF ALL REDUNDANCY (S-BAND, KU-BAND, UHF) DISABLES STATE VECTOR UPDATE CAPABILITIES WHICH COULD RESULT IN LOSS OF CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229, VS70-740299

REPORT DATE 12/31/87

C-219

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1649 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP DATA RATE SELECT SWITCH S19
- 3) DIODE A17CR10
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC PNL SWITCH CONTROL OF UPLINK LDR SELECTION SIGNAL  
TO NSP1 MODE CONTROL. GCIL CONTROL REMAINS INTACT. FULL  
FUNCTIONAL REDUNDANCY PROVIDED BY PARALLEL CKT CONTROLLING NSP2.  
SINGLE FAILURE WOULD HAVE NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229, VS70-740299

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1650 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP DATA RATE SELECT SWITCH S19
- 3) DIODE A17CR12
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANELL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURALL FAILURE,  
VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC PNL SWITCH CONTROL OF UPLINK LDR SELECTION TO NSP2  
MODE CONTROL. GCIL CONTROL REMAINS INTACT. LOSS OF ALL LDR  
UPLINK SELECTION REDUNDANCY WOULD RESTRICT TRANSMISSION TO HDR.  
LOSS OF HDR/LDR SELECTION COULD RESULT IN LOSS OF MISSION.  
LOSS OF ALL REDUNDANCY (S-BAND, KU-BAND, UHF) DISABLES STATE  
VECTOR UPDATE CAPABILITIES WHICH COULD RESULT IN LOSS OF  
CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229, VS70-740299

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1651 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP DATA RATE SELECT SWITCH S19
- 3) DIODE A17CR13
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC PNL SWITCH CONTROL OF S-BAND TRANSPONDER 1 HDR  
UPLINK SELECTION. GCIL CONTROL OF TRANSPONDER 1 SELECTION  
REMAINS INTACT. FULL FUNCTIONAL REDUNDANCY PROVIDED BY PARALLEL  
CKT CONTROLLING TRANSPONDER 2. SINGLE FAILURE WOULD HAVE NO  
EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229, VS70-740299

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1652 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP DATA RATE SELECT SWITCH S19
- 3) DIODE A17CR15
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC PNL SWITCH CONTROL OF S-BAND PM TRANSPONDER 2 HDR  
UPLINK SELECTION. GCIL CONTROL OF TRANSPONDER 2 SELECTION  
REMAINS INTACT. LOSS OF ALL HDR SELECTION ON TRANSPONDERS 1/2  
WOULD RESTRICT UPLINK TO LDR. LOSS OF BOTH HDR/LDR SELECTION  
COULD RESULT IN LOSS OF MISSION. LOSS OF ALL REDUNDANCY (S-BAND,  
KU-BAND, UHF) DISABLES STATE VECTOR UPDATE CAPABILITIES WHICH  
COULD RESULT IN LOSS OF CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229, VS70-740299

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1653 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP DATA RATE SELECT SWITCH S19
- 3) DIODE A17CR14
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC PNL SWITCH CONTROL OF S-BAND PM TRANSPONDER 1 LDR  
UPLINK SELECTION. GCIL CONTROL OF TRANSPONDER 1 SELECTION  
REMAINS INTACT. FULL FUNCTIONAL REDUNDANCY PROVIDED BY PARALLEL  
CKT CONTROLLING TRANSPONDER 2. SINGLE FAILURE WOULD HAVE NO  
EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229, VS70-740299



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1654 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP DATA RATE SELECT SWITCH S19
- 3) DIODE A17CR16
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC PNL SWITCH CONTROL OF S-BAND PM TRANSPONDER 2 LDR  
UPLINK SELECTION. GCIL CONTROL OF TRANSPONDER 2 SELECTION  
REMAINS INTACT. LOSS OF ALL LDR SELECTION ON TRANSPONDERS 1/2  
WOULD RESTRICT UPLINK TO HDR. LOSS OF BOTH HDR/LDR SELECTION  
COULD RESULT IN LOSS OF MISSION. LOSS OF ALL REDUNDANCY (S-BAND,  
KU-BAND, UHF) DISABLES STATE VECTOR UPDATE CAPABILITIES WHICH  
COULD RESULT IN LOSS OF CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229, VS70-740299

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1655 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP CODING SELECT SWITCH S21
- 3) DIODE A18CR1
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC PNL SWITCH CONTROL OF DOWNLINK CODING ON SIGNAL TO  
NSP 1 MODE CONTROL. GCIL CONTROL REMAINS INTACT. FULL  
FUNCTIONAL REDUNDANCY PROVIDED BY PARALLEL CKT CONTROLLING NSP 2.  
SINGLE FAILURE WOULD HAVE NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229, VS70-740299

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1656 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP CODING SELECT SWITCH S21
- 3) DIODE A18CR3
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC PNL SWITCH CONTROL OF DOWNLINK CODING ON SIGNAL TO  
NSP2 MODE CONTROL. GCIL CONTROL REMAINS INTACT. LOSS OF ALL  
REDUNDANCY TO SELECT DOWNLINK CODING COULD RESULT IN LOSS OF  
MISSION. LOSS OF ALL REDUNDANCY (S-BAND, KU-BAND, UHF) DISABLES  
STATE VECTOR UPDATE CAPABILITIES WHICH COULD RESULT IN LOSS OF  
CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229, VS70-740299

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1657 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP CODING SELECT SWITCH S21
- 3) DIODE A18CR2
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC PNL SWITCH CONTROL OF DOWNLINK CODING OFF SIGNAL TO  
NSP 1 MODE CONTROL. GCIL CONTROL REMAINS INTACT. FULL  
FUNCTIONAL REDUNDANCY PROVIDED BY PARALLEL CKT CONTROLLING NSP 2.  
SINGLE FAILURE WOULD HAVE NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229, VS70-740299

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1658 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP CODING SELECT SWITCH S21
- 3) DIODE A18CR4
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATQ:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC PNL SWITCH CONTROL OF DOWNLINK CODING OFF SIGNAL TO  
NSP 2 MODE CONTROL. GCIL CONTROL REMAINS INTACT. LOSS OF ALL  
REDUNDANCY TO TURN OFF DOWNLINK CODING COULD RESULT IN LOSS OF  
MISSION. LOSS OF ALL REDUNDANCY (S-BAND, KU-BAND, UHF)  
DISABLES STATE VECTOR UPDATE CAPABILITIES WHICH COULD RESULT IN  
LOSS OF CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229, VS70-740299

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1659 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP CODING SELECT SWITCH S22
- 3) DIODE A18CR5
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC PNL SWITCH CONTROL OF UPLINK CODING ON SIGNAL TO  
NSP 1 MODE CONTROL. GCIL CONTROL REMAINS INTACT. FULL  
FUNCTIONAL REDUNDANCY PROVIDED BY PARALLEL CKT CONTROLLING NSP 2.  
SINGLE FAILURE WOULD HAVE NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229, VS70-740299

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1660 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP CODING SELECT SWITCH S21
- 3) DIODE A18CR7
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC PNL SWITCH CONTROL OF UNLINK CODING ON SIGNAL TO  
NSP 2 MODE CONTROL. GCIL CONTROL REMAINS INTACT. LOSS OF ALL  
REDUNDANCY TO SELECT UPLINK CODING COULD RESULT IN LOSS OF  
MISSION. LOSS OF ALL REDUNDANCY (S-BAND, KU-BAND, UHF) DISABLES  
STATE VECTOR UPDATE CAPABILITIES WHICH COULD RESULT IN LOSS OF  
CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229, VS70-740299

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1661 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP CODING SELECT SWITCH S21
- 3) DIODE A18CR6
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC PNL SWITCH CONTROL OF UPLINK CODING OFF SIGNAL TO  
NSP 1 MODE CONTROL. GCIL CONTROL REMAINS INTACT. FULL  
FUNCTIONAL REDUNDANCY PROVIDED BY PARALLEL CKT CONTROLLING NSP 2.  
SINGLE FAILURE WOULD HAVE NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229, VS70-740299

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 1662 ABORT: 3/1R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP CODING SELECT SWITCH S21
- 3) DIODE A18CR8
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC PNL SWITCH CONTROL OF UPLINK CODING OFF SIGNAL TO  
NSP 2 MODE CONTROL. GCIL CONTROL REMAINS INTACT. LOSS OF ALL  
REDUNDANCY TO TURN OFF UPLINK CODING COULD RESULT IN LOSS OF  
MISSION. LOSS OF ALL REDUNDANCY (S-BAND, KU-COMM, UHF) DISABLES  
STATE VECTOR UPDATE CAPABILITIES WHICH COULD RESULT IN LOSS OF  
CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229, VS70-740299

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/14/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1663 ABORT: 3/2R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP ENCRYPTION MODE SELECT SWITCH S25
- 3) DIODE A13CR1
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

WITH NSP 1 ON, RESULTS IN LOSS OF 28VDC RECEIVE ENCRYPTED SIGNAL  
TO NSP 1. REDUNDANCY FOR THIS INPUT PROVIDED VIA DIODE A13CR2,  
BUT SWITCH 25 MUST BE IN SELECT AND SWITCH 26 IN T/R OR RCV.  
HOWEVER, THESE SW POSITIONS DISABLE RCD ENCRYPTION SIGNAL TO  
NSP 1. SINGLE FAILURE WOULD HAVE NO EFFECT ON  
MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/14/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1664 ABORT: 3/2R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP ENCRYPTION MODE SELECT SWITCH S25
- 3) DIODE A13CR2
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

WITH NSP 1 ON, RESULTS IN REDUNDANT PATH LOSS OF 28VDC RECEIVE  
ENCRYPTED SIGNAL TO NSP 1. FULL FUNCTIONAL REDUNDANCY PROVIDED  
BY PARALLEL CKT CONTROLLING NSP 2. LOSS OF ALL REDUNDANCY  
DISABLES ENCRYPTION CAPABILITIES AND COULD CAUSE LOSS OF MISSION.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/15/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1665 ABORT: 3/2R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP ENCRYPTION MODE SELECT SWITCH S25
- 3) DIODE A13CR4
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION:  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

WITH NSP 2 ON, RESULTS IN LOSS OF 28VDC RECEIVE ENCRYPTED SIGNAL  
TO NSP 2. REDUNDANCY FOR THIS INPUT PROVIDED VIA DIODE A13CR3,  
BUT SWITCH 25 MUST BE IN SELECT AND SWITCH 26 ON T/R OR RCV.  
HOWEVER, THESE SW POSITIONS DISABLE RCD ENCRYPTED SIGNAL  
TO NSTP 2. SINGLE FAILURE WOULD HAVE NO EFFECT ON  
MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/15/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 1666 ABORT: 3/2R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) NETWORK SIGNAL PROCESSOR, FORWARD/RETURN LINK
- 2) NSP ENCRYPTION MODE SELECT SWITCH S25
- 3) DIODE A13CR3
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

WITH NSP 2 ON, RESULTS IN REDUNDANT PATH LOSS OF 28VDC RECEIVE  
ENCRYPTED SIGNAL TO NSP 2. LOSS OF ALL REDUNDANCY DISABLES  
ENCRYPTION CAPABILITIES AND COULD CAUSE LOSS OF MISSION.

REFERENCES: SSSH 16.3, SYST SCHEM VS70-740229

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/14/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/3  
MDAC ID: 2001 ABORT: 3/3

ITEM: S-BAND FM TRANSMITTER  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND FM SYSTEM
- 3) RF COMM
- 4) S-BAND FM TRANSMITTER
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC478-0106-3001

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
TEMPERATURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

THE S-BAND FM SYSTEM PROVIDES A ONE-WAY WIDE-BAND CHANNEL FOR TRANSMITTING DATA DIRECTLY TO NASA OR DOD GROUND STATIONS. THERE ARE TWO IDENTICAL TRANSMITTERS, USED ONE AT A TIME. LOSS OF THE S-BAND FM TELEMETRY LINK WOULD NOT CAUSE MISSION TERMINATION NOR POSE A THREAT TO CREW/VEHICLE.

REFERENCES: SYSTEM SCHEMATIC VS70-740279; SSSH 16.1, 16.2, 16.8;  
INCO/COMM SYSTEMS BRIEF 11; JSC-12820 FLIGHT RULES SECTION 11

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/14/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/3  
MDAC ID: 2002 ABORT: 3/3

ITEM: S-BAND FM TRANSMITTER  
FAILURE MODE: ERRATIC OPERATION, INTERMITTENT OPERATION

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND FM SYSTEM
- 3) RF COMM
- 4) S-BAND FM TRANSMITTER
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC478-0106-3001

CAUSES: MISHANDLING/ABUSE, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE S-BAND FM SYSTEM PROVIDES A ONE-WAY WIDE-BAND CHANNEL FOR TRANSMITTING DATA DIRECTLY TO NASA OR DOD GROUND STATIONS. THERE ARE TWO IDENTICAL TRANSMITTERS, USED ONE AT A TIME. LOSS OF THE S-BAND FM TELEMETRY LINK WOULD NOT CAUSE MISSION TERMINATION NOR POSE A THREAT TO CREW/VEHICLE.

REFERENCES: SYSTEM SCHEMATIC VS70-740279; SSSH 16.1, 16.2, 16.8;  
INCO/COMM SYSTEMS BRIEF 11, JSC-12820 FLIGHT RULES SECTION 11

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/19/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/3  
MDAC ID: 2003 ABORT: 3/3

ITEM: S-BAND FM RF TRANSFER SWITCH  
FAILURE MODE: FAILS TO OPEN/CLOSE, FAILS TO SWITCH

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND FM SYSTEM
- 3) RF COMM
- 4) S-BAND FM RF TRANSFER SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: ME452-0152-0001

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

THE TRANSFER SWITCH ACCEPTS THE RF OUTPUT OF EITHER S-BAND FM XMTR 1 OR XMTR 2 AND ROUTES THE RF SIGNAL TO THE HEMI ANTENNA SECTION OF THE S-BAND ANTENNA SWITCH ASSEMBLY. LOSS OF TRANSFER SWITCH FUNCTION WOULD NOT CAUSE MISSION TERMINATION NOR POSE A THREAT TO VEHICLE/CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740259, VS70-740279; SSSH 16.1, 16.2, 16.8; INCO/COMM SYSTEMS BRIEF 11, JSC-12820 FLIGHT RULES SECTION 11



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/19/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/3  
MDAC ID: 2004 ABORT: 3/3

ITEM: S-BAND FM RF TRANSFER SWITCH  
FAILURE MODE: FAILS MID-TRAVEL, PHYSICAL BINDING/JAMMING

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND FM SYSTEM
- 3) RF COMM
- 4) S-BAND FM RF TRANSFER SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: ME452-0152-0001

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE

EFFECTS/RATIONALE:

THE TRANSFER SWITCH ACCEPTS THE RF OUTPUT OF EITHER S-BAND FM XMTR 1 OR SMTR 2 AND ROUTES THE RF SIGNAL TO THE HEMI ANTENNA SECTION OF THE S-BAND ANTENNA SWITCH ASSEMBLY. LOSS OF TRANSFER SWITCH FUNCTION WOULD NOT CAUSE MISSION TERMINATION OR POSE A THREAT TO VEHICLE/CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740259, VS70-740279; SSSH 16.1, 16.2, 16.8; INCO/COMM SYSTEMS BRIEF 11, JSC-12820 FLIGHT RULES SECTION 11

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/19/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/3  
MDAC ID: 2005 ABORT: 3/3

ITEM: S-BAND HEMI ANTENNA SWITCH ASSEMBLY  
FAILURE MODE: FAILS TO OPEN/CLOSE, FAILS TO SWITCH

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND FM SYSTEM
- 3) RF COMM
- 4) S-BAND HEMI ANTENNA SWITCH ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC478-0106-4004

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

THE HEMI ANTENNA RF SWITCH ROUTES THE S-BAND FM RF SIGNAL TO EITHER THE UPPER OR LOWER HEMI ANTENNA AND SIMULTANEOUSLY CONNECTS THE HEMI NOT BEING USED FOR THE DOWNLINK FM RF TO THE EMU TV RECEIVER, WHICH IS IN THE ORBITER MIDDECK AREA. THUS WHILE THE LOWER HEMI IS IN USE FOR TELEMETRY TO GROUND, THE UPPER HEMI IS AVAILABLE TO RECEIVE RF MODULATED BY TV SCENES FROM AN EXTRA-VEHICULAR MOBILITY UNIT, AND VICE VERSA. LOSS OF SWITCH ASSEMBLY FUNCTION AND CONSEQUENT LOSS OF S-BAND FM DOWNLINK RF SIGNAL AND/OR EMU TV SCENE WOULD NOT CAUSE MISSION TERMINATION OR POSE A THREAT TO VEHICLE/CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740259; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEF 10, 11

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/19/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/3  
MDAC ID: 2006 ABORT: 3/3

ITEM: S-BAND HEMI ANTENNA SWITCH ASSEMBLY  
FAILURE MODE: FAILS MID-TRAVEL, PHYSICAL BINDING/JAMMING

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND FM SYSTEM
- 3) RF COMM
- 4) S-BAND HEMI ANTENNA SWITCH ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC478-0106-4004

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE

EFFECTS/RATIONALE:

THE HEMI ANTENNA RF SWITCH ROUTES THE S-BAND FM RF SIGNAL TO EITHER THE UPPER OR LOWER HEMI ANTENNA AND SIMULTANEOUSLY CONNECTS THE HEMI NOT BEING USED FOR THE DOWNLINK FM RF TO THE EMU TV RECEIVER, WHICH IS IN THE ORBITER MIDDECK AREA. THUS WHILE THE LOWER HEMI IS IN USE FOR TELEMETRY TO GROUND, THE UPPER HEMI IS AVAILABLE TO RECEIVE RF MODULATED BY TV SCENES FROM AN EXTRA-VEHICULAR MOBILITY UNIT, AND VICE VERSA. LOSS OF SWITCH ASSEMBLY FUNCTION AND CONSEQUENT LOSS OF S-BAND FM DOWNLINK RF SIGNAL AND/OR EMU TV SCENE WOULD NOT CAUSE MISSION TERMINATION OR POSE A THREAT TO VEHICLE/CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740259; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEF 10, 11

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/20/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/3  
MDAC ID: 2007 ABORT: 3/3

ITEM: FM (HEMI) RF SWITCH ELECTRONICS  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, OPEN (ELECTRICAL),  
LOSS OF OUTPUT, SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND FM SYSTEM
- 3) RF COMM
- 4) HEMI SWITCH ELECTRONICS
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC478-0106-4004

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
TEMPERATURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

THE HEMI RF SWITCH IS CONTROLLED BY EITHER OF TWO (REDUNDANT) CONTROL ELECTRONICS LOGIC CIRCUITS, EACH OF WHICH CONTROLS ONE OF TWO (REDUNDANT) SETS OF SWITCH OPERATING COILS. LOSS OF OUTPUT OF A CONTROL/DRIVER CIRCUIT WOULD CAUSE LOSS OF ACTUATION CAPABILITY FOR SELECTION OF THE ASSOCIATED SWITCH POSITION (AND THUS CAPABILITY FOR SELECTION OF THE ASSOCIATED HEMI ANTENNA) BY THAT ELECTRONICS SET. WITH LOSS OF ONE CONTROL CHANNEL, THE REDUNDANT CHANNEL WOULD BE USED. LOSS OF ALL CAPABILITY TO CONTROL SELECTION OF HEMI ANTENNAS WOULD NOT CAUSE MISSION TERMINATION NOR WOULD IT POSE A THREAT TO VEHICLE/CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740259; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEF 10, 11

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/19/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/3  
MDAC ID: 2008 ABORT: 3/3

ITEM: S-BAND HEMI ANTENNA  
FAILURE MODE: OPEN (ELECTRICAL), LOSS OF OUTPUT, SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND FM SYSTEM
- 3) RF COMM
- 4) S-BAND HEMI ANTENNAS
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE  
PART NUMBER: ME481-0090-0003, 0004

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

THE TWO HEMI ANTENNAS, USED ONE AT A TIME FOR THE DOWNLINK S-BAND FM RF SIGNAL FOR TELEMETRY TO GROUND, ARE SELECTED EITHER UNDER GPC CONTROL OR MANUALLY FOR OPTIMUM LOOK ANGLE TO A GROUND STATION. WHILE THE LOWER HEMI IS BEING USED FOR TELEMETRY TO GROUND, THE UPPER ONE CAN BE USED FOR RECEIPT OF RF MODULATED BY AN EMU TV CAMERA SCENE, AND VICE VERSA. LOSS OF HEMI ANTENNA FUNCTION AND SUBSEQUENT LOSS OF S-BAND FM DOWNLINK RF SIGNAL AND/OR EMU TV SCENE WOULD NOT CAUSE MISSION TERMINATION OR POSE A THREAT TO VEHICLE/CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740259; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEF 10, 11

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/19/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/3  
MDAC ID: 2009 ABORT: 3/3

ITEM: S-BAND HEMI ANTENNA  
FAILURE MODE: ERRATIC OPERATION, INTERMITTENT OPERATION

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND FM SYSTEM
- 3) RF COMM
- 4) S-BAND HEMI ANTENNAS
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD FUSELAGE  
PART NUMBER: ME481-0090-0003, 0004

CAUSES: MISHANDLING/ABUSE, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE TWO HEMI ANTENNAS, USED ONE AT A TIME FOR THE DOWNLINK S-BAND FM RF SIGNAL FOR TELEMETRY TO GROUND, ARE SELECTED EITHER UNDER GPC CONTROL OR MANUALLY FOR OPTIMUM LOOK ANGLE TO A GROUND STATION. WHILE THE LOWER HEMI IS BEING USED FOR TELEMETRY TO GROUND, THE UPPER ONE CAN BE USED FOR RECEIPT OF RF MODULATED BY AN EMU TV CAMERA SCENE, AND VICE VERSA. LOSS OF HEMI ANTENNA FUNCTION AND SUBSEQUENT LOSS OF S-BAND FM DOWNLINK RF SIGNAL AND/OR EMU TV SCENE WOULD NOT CAUSE MISSION TERMINATION OR POSE A THREAT TO VEHICLE/CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740259; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEF 10, 11

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/20/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/3  
MDAC ID: 2010 ABORT: 3/3

ITEM: S-BAND FM POWER SWITCH  
FAILURE MODE: FAILS MID-TRAVEL, PHYSICAL BINDING/JAMMING, FAILS  
TO SWITCH

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND FM SYSTEM
- 3) RF COMM
- 4) S-BAND FM SYSTEM POWER SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1R  
PART NUMBER: ME452-0102-7403

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS SWITCH HAS THREE POSITIONS: 1/OFF/2. WITH THE GCIL SWITCH (PANEL/COMMAND) IN "PANEL", THE FM SYSTEM PANEL POWER SWITCH HAS CONTROL OF POWER APPLICATION TO FM XMTR 1/FMSP 1 (POSITION 1), FM XMTR 2/FMSP 2 (POSITION 2), OR TO NEITHER SET (OFF). IF THE GCIL SWITCH IS IN "COMMAND," CONTROL OF POWER APPLICATION IS VIA GCIL COMMAND OR SSO KYBD ONLY. WITH LOSS OF CAPABILITY TO CONTROL POWER TO THE S-BAND FM SYSTEM LRUS BY PANEL POWER SWITCH, THE SYSTEM SELECTIONS WOULD BE MANAGED BY GROUND COMMAND, WHICH IS THE NORMAL CONTROL MODE. COMPLETE LOSS OF CAPABILITY TO CONTROL POWER TO THE SYSTEM IN EITHER "PANEL" OR "COMMAND" MODE WOULD NOT BE CRITICAL TO MISSION OR TO CREW/VEHICLE.

REFERENCES: SYSTEM SCHEMATIC VS70-740259; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEF 10, 11

REPORT DATE 12/31/87 C-247

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/20/87  
SUBSYSTEM: COMM & TRACK  
MDAC ID: 2011

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: S-BAND FM POWER SWITCH  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND FM SYSTEM
- 3) RF COMM
- 4) S-BAND FM SYSTEM POWER SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1R  
PART NUMBER: ME452-0102-7403

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS THREE-POSITION SWITCH (1/OFF/2) CONTROLS POWER TO FM XMTR 1, FMSP 1/(OFF)/FM XMTR 2, FMSP 2 WHEN THE S-BAND FM SYSTEM IS IN THE GCIL "PANEL" MODE. A SHORT TO GROUND IN THE SWITCH COULD KILL LRU VOLTAGE FROM EITHER CONTROL BUS BC1 (FOR FM LRU STRING 1) OR CONTROL BUS BC2 (STRING 2), OR POSSIBLY BOTH BUSES, BUT EACH BUS CIRCUIT IS PROTECTED BY A 1.2 K-OHM CURRENT-LIMITING RESISTOR. HOWEVER, POWER FOR BOTH GCIL "PANEL" AND "COMMAND" MODES COULD BE LOST FOR EITHER STRING OR BOTH STRINGS. COMPLETE LOSS OF BOTH STRINGS WOULD NOT CRITICAL TO MISSION OR TO CREW/VEHICLE.

REFERENCES: SYSTEM SCHEMATIC VS70-740259; SSSH 16.1, 16.2;  
INCO/COMM SYSTEMS BRIEF 10, 11

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/20/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 2012 ABORT: 3/1R

ITEM: S-BAND FM SYSTEM PANEL/COMMAND GCIL SWITCH  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND FM SYSTEM
- 3) GROUND COMMAND INTERFACE LOGIC
- 4) S-BAND FM SYSTEM PANEL/COMMAND SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1R  
PART NUMBER: ME452-0102-7201

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS SWITCH PERMITS PANEL CONTROL OF THE S-BAND FM SYSTEM CONFIGURATION BY THE CREW WHEN IT IS IN THE "PANEL" POSITION, AND CONTROL BY GROUND GCIL COMMANDS OR KEYBOARD ENTRIES WHEN IT IS IN THE "COMMAND" POSITION. A HARD INTERNAL SHORT TO GROUND COULD TRIP CB44 (MNA) AND CB49 (MNC) ON PANEL R15, DISABLING "COMMAND" MODE FOR ALL FIVE COMM GCIL SYSTEMS AND CAUSING DEFAULT TO PANEL MODE FOR THEM. LOSS OF OPERATIONAL REDUNDANCY FOR CONTROL OF THE S-BAND FM SYSTEM BY PANEL SWITCHES ("PANEL" MODE) WOULD NOT BE CRITICAL TO MISSION OR TO CREW/VEHICLE. HOWEVER, SUCH A FAULT COULD BE CRITICAL TO OTHER SYSTEMS (E.G., SEE 142, S-BAND PM/NSP SYSTEM PNL/CMD SWITCH) BECAUSE OF DEFAULT TO PNL MODE FOR ALL FIVE C&T GCIL SYSTEMS.

REFERENCES: SYSTEM SCHEMATIC VS70-740259, VS70-740299; SSSH 16.1, 16.2; INCO/COMM SYSTEMS BRIEF 10, 11

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/3  
MDAC ID: 2013 ABORT: 3/3

ITEM: S-BAND FM SYSTEM DATA SOURCE SELECTOR  
FAILURE MODE: ALL CREDIBLE MODES

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND FM SYSTEM
- 3) SIGNAL PROCESSING
- 4) DATA SOURCE SELECTOR
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1R  
PART NUMBER: ME452-0093-5037

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

THIS ROTARY SWITCH PERMITS THE CREW TO USE PANEL SWITCHES TO SELECT FROM AMONG SEVEN POSSIBLE DATA SOURCES WITH THE S-BAND FM SYSTEM IN "PANEL" MODE, AND CONTROL BY GROUND GCIL COMMANDS OR KEYBOARD ENTRIES WHEN IT IS IN "COMMAND" MODE. LOSS OF FUNCTION OF THE SELECTOR SWITCH AND CONSEQUENT LOSS OF THE S-BAND FM SYSTEM WOULD NOT BE CRITICAL TO MISSION OR TO CREW/VEHICLE.

REFERENCES: SYSTEM SCHEMATIC VS70-740259, VS70-740299; SSSH  
16.1, 16.2; INCO/COMM SYSTEMS BRIEF 10, 11

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/3  
MDAC ID: 2014 ABORT: 3/3

ITEM: S-BAND FM SIGNAL PROCESSOR  
FAILURE MODE: ALL CREDIBLE MODES

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND FM SYSTEM
- 3) SIGNAL PROCESSING
- 4) S-BAND FM SIGNAL PROCESSOR
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC478-0106-3501

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
TEMPERATURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

THE ACTIVE S-BAND FM SIGNAL PROCESSOR ACCEPTS DATA INPUTS  
SELECTED BY THE DATA SOURCE SELECTOR ROTARY SWITCH WITH THE S-  
BAND FM SYSTEM IN GCIL "PANEL" MODE, OR AS SELECTED BY GCIL  
GROUND COMMAND OR BY KEYBOARD IN "COMMAND" MODE. INPUT SIGNALS  
- ANALOG OR DIGITAL - ARE ROUTED TO SIGNAL CONDITIONING OR  
FILTERING DEVICES AS APPROPRIATE AND THEN SENT TO THE FM XMTR.  
UPON FAILURE OF THE ACTIVE FMSP, THE REDUNDANT STRING (FMSP/XMTR)  
WOULD BE USED. LOSS OF BOTH FM STRINGS WOULD NOT BE CRITICAL TO  
MISSION OR TO CREW/VEHICLE.

REFERENCES: SCHEMATIC VS70-740269; SSSH 16.1, 16.8; INCO/COMM  
SYSTEMS BRIEF 11; FLIGHT RULES JSC-12820, SECTION 11

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/05/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 2501 ABORT: 3/3

ITEM: HYBRID DRIVER, TYPE III  
FAILURE MODE: LOSS OF OUTPUT, OPEN CIRCUIT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) FM TRANSMITTER POWER CONTROL CIRCUIT
- 4) LOAD CONTROL ASSY (LCA) 2
- 5) HYBRID DRIVER, TYPE III
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 82V76A17ARIII(J6-A)  
PART NUMBER: MC477-0263-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS HYBRID DRIVER IN LCA 2 PROVIDES DEDICATED 28VDC POWER TO THE  
ASSOCIATED S-BAND FM TRANSMITTERS.

THIS FAILURE WOULD CAUSE LOSS OF POWER TO ONE OF THE TWO  
REDUNDANT FM TRANSMITTERS.

A SECOND FAILURE COULD CAUSE LOSS OF BOTH FM TRANSMITTERS.  
HOWEVER, THE FUNCTION OF THE FM TRANSMITTER IS NOT CRITICAL TO  
THE MISSION AND ITS LOSS WOULD NOT ENDANGER THE CREW OR VEHICLE.

REFERENCES: VS70-740279, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/05/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 2502 ABORT: 3/3

ITEM: HYBRID DRIVER, TYPE III  
FAILURE MODE: LOSS OF OUTPUT, OPEN CIRCUIT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) FM TRANSMITTER POWER CONTROL CIRCUIT
- 4) LOAD CONTROL ASSY (LCA) 3
- 5) HYBRID DRIVER, TYPE III
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 82V76A18ARIIII(J5-Z)  
PART NUMBER: MC477-0263-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS HYBRID DRIVER IN LCA 3 PROVIDES DEDICATED 28VDC POWER TO THE  
ASSOCIATED S-BAND FM TRANSMITTER.

THIS FAILURE WOULD CAUSE LOSS OF POWER TO ONE OF THE TWO  
REDUNDANT FM TRANSMITTERS.

A SECOND FAILURE WOULD CAUSE LOSS OF BOTH FM TRANSMITTERS.  
HOWEVER, THE FUNCTION OF THE FM TRANSMITTER IS NOT CRITICAL TO  
THE MISSION AND ITS LOSS WOULD NOT ENDANGER THE CREW OR VEHICLE.

REFERENCES: VS70-740279, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/05/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 2503 ABORT: 3/3

ITEM: HYBRID DRIVER, TYPE III  
FAILURE MODE: FAILS SHORTED, INADVERTENT OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) FM TRANSMITTER POWER CONTROL CIRCUIT
- 4) LOAD CONTROL ASSY (LCA) 2
- 5) HYBRID DRIVER, TYPE III
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 82V76A17ARIII(J6-A)  
PART NUMBER: MC477-0263-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS HYBRID DRIVER IN LCA 2 PROVIDES DEDICATED 28VDC POWER TO THE  
ASSOCIATED S-BAND FM TRANSMITTERS.

THIS FAILURE WOULD RESULT IN INABILITY TO TURN OFF THE AFFECTED  
FM TRANSMITTER.

THIS FAILURE WOULD NOT BE CRITICAL TO MISSION OR TO CREW/VEHICLE.

REFERENCES: VS70-740279, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/05/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 2504 ABORT: 3/3

ITEM: HYBRID DRIVER, TYPE III  
FAILURE MODE: FAILS SHORTED, INADVERTENT OUTPUT

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) FM TRANSMITTER POWER CONTROL CIRCUIT
- 4) LOAD CONTROL ASSY (LCA) 3
- 5) HYBRID DRIVER, TYPE III
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 82V76A18ARIII (J5-Z)  
PART NUMBER: MC477-0263-0002

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS HYBRID DRIVER IN LCA 3 PROVIDES DEDICATED 28VDC POWER TO THE  
ASSOCIATED S-BAND FM TRANSMITTERS.

THIS FAILURE WOULD RESULT IN INABILITY TO TURN OFF THE AFFECTED  
FM TRANSMITTER.

THIS FAILURE WOULD NOT BE CRITICAL TO MISSION OR TO CREW/VEHICLE.

REFERENCES: VS70-740279, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87  
SUBSYSTEM: C&T/EPD&C/S-BAND  
MDAC ID: 2505

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: FUSE, 3 AMP  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) FM RF POWER SWITCH CONTROL CIRCUIT
- 4) LOAD CONTROL ASSY (LCA) 2
- 5) FUSE, 3 AMP
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 82V76A17(J4-121)  
PART NUMBER: ME451-0010-1030

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS FUSE IN LCA 2 PROTECTS THE ASSOCIATED FM TRANSMITTER "POWER-ON" INDICATION CIRCUIT.

FAILURE OF THIS FUSE WOULD CAUSE LOSS OF ABILITY TO USE THE ASSOCIATED FM TRANSMITTER. A SUBSEQUENT FAILURE IN THE REDUNDANT CIRCUIT WOULD CAUSE LOSS OF USE OF THE FM TRANSMISSION FUNCTION. THE FM TRANSMITTER FUNCTIONAL LOSS IS NOT CRITICAL TO THE MISSION OR CREW/VEHICLE.

REFERENCES: VS70-740279, SPACE SHUTTLE SYSTEMS HANDBOOK



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 2506 ABORT: 3/3

ITEM: FUSE, 3 AMP  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) FM RF POWER SWITCH CONTROL CIRCUIT
- 4) LOAD CONTROL ASSY (LCA) 3
- 5) FUSE, 3 AMP
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 82V76A18(J4-121)  
PART NUMBER: ME451-0010-1030

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS FUSE IN LCA 3 PROTECTS THE ASSOCIATED FM TRANSMITTER "POWER-ON" INDICATION CIRCUIT. FAILURE OF THIS FUSE WOULD CAUSE LOSS OF ABILITY TO USE THE ASSOCIATED FM TRANSMITTER. A SUBSEQUENT FAILURE IN THE REDUNDANT CIRCUIT WOULD CAUSE LOSS OF USE OF THE FM TRANSMISSION FUNCTION. THE FM TRANSMITTER FUNCTIONAL LOSS IS NOT CRITICAL TO THE MISSION OR CREW/VEHICLE.

REFERENCES: VS70-740279, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/05/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 2507 ABORT: 3/3

ITEM: SWITCH, 4-POLE, 3-POS, S3  
FAILURE MODE: FAILS OPEN, FAILS TO TRANSFER

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) FM TRANSMITTER POWER CONTROL CIRCUIT
- 4) PANEL A1A3
- 5) SWITCH, 4-POLE, 3-POS, S3
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A1A3S3  
PART NUMBER: ME452-0102-7403

CAUSES: MISHANDLING, MECHANICAL/STRUCTURAL MALFUNCTION,  
SHOCK/VIBRATION, CONTAMINATION/CORROSION/DETERIORATION,  
TEMPERATURE LIMITS EXCEEDED.

EFFECTS/RATIONALE:

SWITCH S3 ON PANEL A1A3 PROVIDES THE CAPABILITY TO APPLY POWER TO ONE OF THE REDUNDANT S-BAND FM TRANSMITTERS. FAILURE OF THIS SWITCH TO TURN ON POWER TO ONE OF THE TRANSMITTERS CAUSES LOSS OF USE OF THAT TRANSMITTER. THIS FAILURE WOULD NOT BE CRITICAL TO THE MISSION OR THE CREW/VEHICLE.

REFERENCES: VS70-740279, VS70-740269, VS70-740299, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/05/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 2508 ABORT: 3/3

ITEM: SWITCH, 4-POLE, 3-POS, S3  
FAILURE MODE: FAILS SHORTED TO GROUND

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) FM TRANSMITTER POWER CONTROL CIRCUIT
- 4) PANEL A1A3
- 5) SWITCH, 4-POLE, 3-POS, S3
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A1A3S3  
PART NUMBER: ME452-0102-7403

CAUSES: MISHANDLING, MECHANICAL/STRUCTURAL MALFUNCTION,  
SHOCK/VIBRATION, CONTAMINATION/CORROSION/DETERIORATION,  
TEMPERATURE LIMITS EXCEEDED.

EFFECTS/RATIONALE:

SWITCH S3 ON PANEL A1A3 PROVIDES THE CAPABILITY TO APPLY POWER TO  
ONE OF THE REDUNDANT S-BAND FM TRANSMITTERS.  
WITH THE SWITCH FAILED SHORTED TO GROUND THE FM TRANSMITTER  
FUNCTION WOULD BE LOST.  
LOSS OF THE S-BAND FM TRANSMITTER FUNCTION IS NOT CRITICAL TO  
EITHER THE MISSION OR THE CREW/VEHICLE.

REFERENCES: VS70-740279, VS70-740269, VS70-740299, SPACE SHUTTLE  
SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/05/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 2509 ABORT: 3/3

ITEM: SWITCH, 4-POLE, 3-POS, S3  
FAILURE MODE: FAILS SHORTED CONTACT TO CONTACT, INADVERTENT  
OPERATION

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) FM TRANSMITTER POWER CONTROL CIRCUIT
- 4) PANEL A1A3
- 5) SWITCH, 4-POLE, 3-POS, S3
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A1A3S3  
PART NUMBER: ME452-0102-7403

CAUSES: MISHANDLING, MECHANICAL/STRUCTURAL MALFUNCTION,  
SHOCK/VIBRATION, CONTAMINATION/CORROSION/DETERIORATION,  
TEMPERATURE LIMITS EXCEEDED.

EFFECTS/RATIONALE:

SWITCH S3 ON PANEL A1A3 PROVIDES THE CAPABILITY TO APPLY POWER TO ONE OF THE REDUNDANT S-BAND FM TRANSMITTERS WITH THE FM SYSTEM IN PANEL MODE. THIS FAILURE COULD CAUSE BOTH FM TRANSMITTERS TO BE POWERED SIMULTANEOUSLY. THIS WOULD CAUSE LOSS OF FUNCTION OF BOTH TRANSMITTERS BECAUSE THE RF TRANSFER SWITCH WOULD CYCLE. LOSS OF THE S-BAND FM TRANSMITTER FUNCTION IS NOT CRITICAL TO EITHER THE MISSION OR THE CREW/VEHICLE.

REFERENCES: VS70-740279, VS70-740269, VS70-740299, SPACE SHUTTLE  
SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 2510 ABORT: 3/3

ITEM: RESISTOR, 1.2K OHM, 2W, A2R8  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) FM SIGNAL PROCESSOR UNIT #1 POWER CONTROL CIRCUIT
- 4) PANEL A1A3
- 5) RESISTOR, 1.2K OHM, 2W, A2R8
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A1A3A2R8  
PART NUMBER: RWR80S1211FR

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS RESISTOR PROVIDES CURRENT LIMITING PROTECTION TO THE  
ASSOCIATED FM SIGNAL PROCESSOR POWER CONTROL CIRCUIT.  
THIS FAILURE WOULD CAUSE LOSS OF ABILITY TO PROVIDE POWER TO THE  
FM SIGNAL PROCESSOR #1 CONTROL CIRCUIT.  
LOSS OF THE S-BAND FM SYSTEM FUNCTION IS NOT CRITICAL TO EITHER  
THE MISSION OR THE CREW/VEHICLE.

REFERENCES: VS70-740279, VS70-740269, VS70-740299, SPACE SHUTTLE  
SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 2511 ABORT: 3/3

ITEM: RESISTOR, 1.2K OHM, 2W, A2R9  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) FM TRANSMITTER #1 POWER CONTROL CIRCUIT
- 4) PANEL A1A3
- 5) RESISTOR, 1.2K OHM, 2W, A2R9
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A1A3A2R9  
PART NUMBER: RWR80S1211FR

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS RESISTOR PROVIDES CURRENT LIMITING PROTECTION TO THE FM  
TRANSMITTER #1 POWER CONTROL CIRCUIT.  
THIS FAILURE WOULD CAUSE LOSS OF ABILITY TO PROVIDE POWER TO FM  
TRANSMITTER #1.  
LOSS OF THE S-BAND FM TRANSMITTER FUNCTION IS NOT CRITICAL TO  
EITHER THE MISSION OR THE CREW/VEHICLE.

REFERENCES: VS70-740279, VS70-740269, VS70-740299, SPACE SHUTTLE  
SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 2512 ABORT: 3/3

ITEM: RESISTOR, 1.2K OHM, 2W, A2R10  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) FM SIGNAL PROCESSOR UNIT #2 POWER CONTROL CIRCUIT
- 4) PANEL A1A3
- 5) RESISTOR, 1.2K OHM, 2W, A2R10
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A1A3A2R10  
PART NUMBER: RWR80S1211FR

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS RESISTOR PROVIDES CURRENT LIMITING PROTECTION TO THE  
ASSOCIATED FM SIGNAL PROCESSOR POWER CONTROL CIRCUIT.  
THIS FAILURE WOULD CAUSE LOSS OF ABILITY TO PROVIDE POWER TO THE  
FM SIGNAL PROCESSOR #2 CONTROL CIRCUIT.  
LOSS OF THE S-BAND FM SYSTEM FUNCTION IS NOT CRITICAL TO EITHER  
THE MISSION OR THE CREW/VEHICLE.

REFERENCES: VS70-740279, VS70-740269, VS70-740299, SPACE SHUTTLE  
SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: C&T/EPD&C/S-BAND FLIGHT: 3/3  
MDAC ID: 2513 ABORT: 3/3

ITEM: RESISTOR, 1.2K OHM, 2W, A2R11  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.W. ROBINSON SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMMUNICATIONS AND TRACKING
- 2) EPD&C/S-BAND
- 3) FM TRANSMITTER #2 POWER CONTROL CIRCUIT
- 4) PANEL A1A3
- 5) RESISTOR, 1.2K OHM, 2W, A2R11
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A1A3A2R11  
PART NUMBER: RWR80S1211FR

CAUSES: MISHANDLING, MECHANICAL SHOCK/VIBRATION,  
CONTAMINATION/CORROSION/DETERIORATION, TEMPERATURE LIMITS  
EXCEEDED.

EFFECTS/RATIONALE:

THIS RESISTOR PROVIDES CURRENT LIMITING PROTECTION TO THE FM  
TRANSMITTER #2 POWER CONTROL CIRCUIT.

THIS FAILURE WOULD CAUSE LOSS OF ABILITY TO PROVIDE POWER TO THE  
FM TRANSMITTER #2.

LOSS OF THE S-BAND FM TRANSMITTER FUNCTION IS NOT CRITICAL TO  
EITHER THE MISSION OR THE CREW/VEHICLE.

REFERENCES: VS70-740279, VS70-740269, VS70-740299, SPACE SHUTTLE  
SYSTEMS HANDBOOK

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 2/2  
MDAC ID: 3001 ABORT: 3/3

ITEM: PAYLOAD ANTENNA  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) RF COMM
- 3) S-BAND PL SYSTEM
- 4) PL ANTENNA
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: UPPER FWD FUSELAGE  
PART NUMBER: MC481-0071-0002

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE,  
PIECE-PART FAILURE, TEMPERATURE, THERMAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

THE PL ANTENNA IS USED BY THE S-BAND PAYLOAD INTERROGATORS FOR TWO-WAY RF COMM WITH COMPATIBLE PAYLOADS FOR PL COMMANDS VIA FORWARD LINK AND PL TELEMETRY VIA RETURN LINK. LOSS OF ANTENNA COULD CAUSE LOSS OF PRIMARY MISSION OBJECTIVES FOR SOME FLIGHTS. THERE IS NO REDUNDANCY FOR THE PL ANTENNA.

REFERENCES: SYS. SCHEM. VS70-740239, SSSH 16.14, INCO/COMM SYS  
BRF 34, OMRSD V74 FILE III

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 3002 ABORT: 3/3

ITEM: PAYLOAD RF TRANSFER SWITCH  
FAILURE MODE: OPEN (ELECTRICAL), LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) PL RF XFER SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ P ] B [ NA ] C [ P ]

LOCATION: AVIONICS BAY 2  
PART NUMBER: ME452-0152-0001

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS RF SWITCH INTERCONNECTS EITHER OF TWO PAYLOAD INTERROGATORS WITH EITHER OF TWO INPUTS TO THE SINGLE PL ANTENNA - ONE INPUT FOR RIGHT HAND CIRCULARLY POLARIZED RADIATION AND ONE FOR LEFT HAND CIRCULARLY POLARIZED RADIATION. THERE ARE TWO RF SWITCH LINKS, ONE OF WHICH CAN CONNECT EITHER PI WITH THE NORMALLY - USED RHCP RADIATING ASSEMBLY. WITH AN OPEN IN THE DESIRED PATH (E.G. PI 1 TO RHCP), THE OTHER PATH (PI 2 TO RHCP), WOULD BE USED. LOSS OF ALL CAPABILITY FOR RF CMD/TLM WITH A PAYLOAD COULD CAUSE LOSS OF PRIMARY MISSION OBJECTIVES.

REFERENCES: SYS. SCHEM. VS70-740239, SSSH 16.14, INCO/COMM SYS BRF 34, OMRSD V74 FILE III

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 2/2  
MDAC ID: 3003 ABORT: 3/3

ITEM: PAYLOAD RF TRANSFER SWITCH  
FAILURE MODE: FAILS MID-TRAVEL, PHYSICAL BINDING/JAMMING, FAILS  
TO SWITCH

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) PL RF XFER SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AVIONICS BAY 2  
PART NUMBER: ME452-0152-0001

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

THIS RF SWITCH INTERCONNECTS EITHER OF TWO PAYLOAD INTERROGATORS WITH EITHER OF TWO INPUTS TO THE SINGLE PL ANTENNA - ONE FOR RIGHT HAND AND ONE FOR LEFT HAND CIRCULARLY POLARIZED RADIATION. TWO LATCHING RELAY COIL SETS CONTROL THE RF BRIDGING LINK PATHS. BINDING/JAMMING COULD PREVENT TRAVEL OF EITHER OF THE MOVING CONTACTS POWERING THE OPERATING COILS OR EITHER OF THE MOVING RF LINKS. EITHER PROBLEM COULD DISABLE THE NON-REDUNDANT XFER SWITCH AND CAUSE LOSS OF PL RF COMM. LOSS OF RF COMM FOR PL CMD/TLM COULD CAUSE LOSS OF MAJOR MISSION OBJECTIVES AND LOSS OF MISSION.

REFERENCES: SYS. SCHEM. VS70-740239, SSSH 16.14, INCO/COMM SYS  
BRF 34, OMRSD V74 FILE III

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 2/2  
MDAC ID: 3004 ABORT: 3/3

ITEM: PAYLOAD RF TRANSFER SWITCH  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) PL RF XFER SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AVIONICS BAY 2  
PART NUMBER: ME452-0152-0001

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

THIS RF SWITCH INTERCONNECTS EITHER OF THE TWO PAYLOAD INTERROGATORS WITH EITHER OF TWO INPUTS TO THE SINGLE PL ANTENNA - ONE FOR RIGHT HAND AND ONE FOR LEFT HAND CIRCULARLY POLARIZED RADIATION. TWO LATCHING RELAY COIL SETS CONTROL THE RF BRIDGING LINK PATHS. A HARD SHORT TO GROUND AFFECTING EITHER POWER TO THE OPERATING COILS OR THE RF SIGNAL PATH COULD DISABLE THE NON-REDUNDANT XFER SWITCH AND CAUSE LOSS OF PL RF COMM. LOSS OF RF COMM FOR PL CMD/TLM COULD CAUSE LOSS OF MAJOR MISSION OBJECTIVES AND LOSS OF MISSION.

REFERENCES: SYS. SCHEM. VS70-740239, SSSH 16.14, INCO/COMM SYS BRF 34, OMRSD V74 FILE III

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 3005 ABORT: 3/3

ITEM: PAYLOAD INTERROGATOR FORWARD LINK  
FAILURE MODE: OPEN (ELECTRICAL), LOSS OF OUTPUT, SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) PI FORWARD LINK
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 2  
PART NUMBER: MC478-0105-0001

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

THE PI'S PROVIDE TWO-WAY RF COMM FOR FL COMMANDS TO AND RL  
TELEMETRY FROM RF-COMPATIBLE PAYLOADS. WITH LOSS OF ACTIVE PI FL  
FOR PL COMMANDS THE REDUNDANT PI WOULD BE USED. LOSS OF OUTPUT  
(OPEN, SHORT, DE-TUNING) COULD BE CAUSED BY TEMPERATURE EXTREME,  
CONTAMINATION, OR PIECE-PART FAILURE. LOSS OF ALL CAPABILITY TO  
SEND COMMANDS TO A PL VIA RF COULD CAUSE LOSS OF MAJOR MISSION  
OBJECTIVES.

REFERENCES: SYS. SCHEM. VS70-740239, SSSH 16.14, INCO/COMM SYS  
BRF 34, OMRSD V74 FILE III

REPORT DATE 12/31/87

C-269

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 3006 ABORT: 3/3

ITEM: PAYLOAD INTERROGATOR FORWARD LINK  
FAILURE MODE: FAILS OUT OF TOLERANCE

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) PI FORWARD LINK
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 2  
PART NUMBER: MC478-0105-0001

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

THE PI'S PROVIDE TWO-WAY RF COMM FOR FL COMMANDS TO AND RL  
TELEMETRY FROM RF-COMPATIBLE PAYLOADS. WITH LOSS OF ACTIVE PI FL  
FOR PL COMMANDS THE REDUNDANT PI WOULD BE USED. OUT-OF-TOLERANCE  
PERFORMANCE (E.G., LOSS OF POWER, DE-TUNING) COULD BE CAUSED  
BY TEMPERATURE EXTREME, CONTAMINATION, OR PIECE-PART FAILURE.  
LOSS OF ALL CAPABILITY TO SEND COMMANDS TO A PL VIA RF COULD  
CAUSE LOSS OF MAJOR MISSION OBJECTIVES.

REFERENCES: SYS. SCHEM. VS70-740239, SSSH 16.14, INCO/COMM SYS  
BRF 34, OMRSD V74 FILE III

REPORT DATE 12/31/87

C-270

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 3007 ABORT: 3/3

ITEM: PAYLOAD INTERROGATOR FORWARD LINK  
FAILURE MODE: ERRATIC OPERATION, INTERMITTENT OPERATION

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) PI RL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 2  
PART NUMBER: MC478-0105-0001

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE,  
VIBRATION

EFFECTS/RATIONALE:

THE PI'S PROVIDE TWO-WAY RF COMM FOR FL CMD'S TO AND RL TLM FROM RF-COMPATIBLE PAYLOADS. ERRATIC/INTERMITTENT OPERATION COULD BE CAUSED BY CONTAMINATION, TEMPERATURE EXTREME, PART FAILURE, LOOSE CONNECTION/VIBRATION. WITH LOSS OF ACTIVE PI FL FOR PL CDM'S VIA RF THE REDUNDANT PI WOULD BE USED. LOSS OF ALL CAPABILITY TO SEND COMMANDS TO A PL VIA RF LINK COULD CAUSE LOSS OF MAJOR MISSION OBJECTIVES (SOME PL'S ARE CHECKED OUT PRE-LAUNCH AND INITIALIZED VIA PI RF).

REFERENCES: SYS. SCHEM. VS70-740239, SSSH 16.14, INCO/COMM SYS  
BRF 34, OMRSD V74 FILE III

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 3008 ABORT: 3/3

ITEM: PAYLOAD INTERROGATOR RETURN LINK  
FAILURE MODE: OPEN (ELECTRICAL), LOSS OF OUTPUT, SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) PI RETURN LINK
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 2  
PART NUMBER: MC478-0105-0001

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

THE PI'S PROVIDE TWO-WAY RF COMM FOR FL COMMANDS TO AND RL  
TELEMETRY FROM RF-COMPATIBLE PAYLOADS. WITH LOSS OF ACTIVE PI RL  
FOR PL TELEMETRY THE REDUNDANT PI WOULD BE USED. LOSS OF OR  
SEVERE DEGRADATION OF RECEIVER OUTPUT COULD BE CAUSED BY  
TEMPERATURE EXTREME, DETUNING, OR PIECE-PART FAILURE. LOSS OF  
ALL CAPABILITY TO RECEIVE PL TELEMETRY AND CONVERT IT TO BASEBAND  
FOR ROUTING TO PAYLOAD SIGNAL PROCESSOR, CIU, OR KU-BAND SIGNAL  
PROCESSOR COULD CAUSE LOSS OF MAJOR MISSION OBJECTIVES.

REFERENCES: SYS. SCHEM. VS70-740239, SSSH 16.14, INCO/COMM SYS  
BRF 34, OMRSD V74 FILE III

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 3009 ABORT: 3/3

ITEM: PAYLOAD INTERROGATOR RETURN LINK  
FAILURE MODE: FAILS OUT OF TOLERANCE

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) PI RETURN LINK
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 2  
PART NUMBER: MC478-0105-0001

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

THE PI'S PROVIDE TWO-WAY RF COMM FOR FL COMMANDS TO AND RL  
TELEMETRY FROM RF-COMPATIBLE PAYLOADS. WITH LOSS OF ACTIVE PI RL  
FOR PL TELEMETRY THE REDUNDANT PI WOULD BE USED. OUT-OF-  
TOLERANCE RECEIVER OUTPUT COULD BE CAUSED BY TEMPERATURE  
EXTREME, DETUNING, OR PIECE-PART FAILURE. LOSS OF ALL CAPABILITY  
TO RECEIVE TELEMETRY AND CONVERT IT TO BASEBAND FOR ROUTING TO  
PAYLOAD SIGNAL PROCESSOR, CIU, OR KU-BAND SIGNAL PROCESSOR COULD  
CAUSE LOSS OF MAJOR MISSION OBJECTIVES.

REFERENCES: SYS. SCHEM. VS70-740239, SSSH 16.14, INCO/COMM SYS  
BRF 34, OMRSD V74 FILE III

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 3010 ABORT: 3/3

ITEM: PAYLOAD INTERROGATOR RETURN LINK  
FAILURE MODE: ERRATIC OPERATION, INTERMITTENT OPERATION

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) PI RETURN LINK
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 2  
PART NUMBER: MC478-0105-0001

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE PI'S PROVIDE TWO-WAY RF COMM FOR FL CMDS TO AND RL TLM FROM RF-COMPATIBLE PAYLOADS. ERRATIC/INTERMITTENT OPERATION COULD BE CAUSED BY CONTAMINATION, TEMPERATURE EXTREME, PART FAILURE, LOOSE CONNECTION/VIBRATION. WITH LOSS OF ACTIVE PI RL FOR PL TLM VIA RF THE REDUNDANT PI WOULD BE USED. LOSS OF ALL CAPABILITY TO RECEIVE PL TLM VIA RF LINK COULD CAUSE LOSS OF MAJOR MISSION OBJECTIVES (SOME PL'S ARE CHECKED OUT PRE-LAUNCH AND INITIALIZED VIA PI RF AND TLM CONFIRMATION OF PL STATUS IS REQUIRED FOR LAUNCH).

REFERENCES: SYS. SCHEM. VS70-740239, SSSH 16.14, INCO/COMM SYS BRF 34, OMRSD V74 FILE III

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 3011 ABORT: 3/3

ITEM: PAYLOAD SIGNAL PROCESSOR FORWARD LINK  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) PSP FL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 2  
PART NUMBER: MC476-0138-0001

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

THE PSP'S PROVIDE TWO-WAY PROCESSING OF PL COMMANDS AND TELEMETRY DATA. THE FL SECTION PROCESSES PL COMMANDS AND ROUTES THEM EITHER TO THE ACTIVE PAYLOAD INTERROGATOR FOR RF FL (OR TO GSE UMBILICAL) OR VIA HARDLINE FOR ATTACHED PAYLOADS. LOSS OF OUTPUT COULD BE CAUSED BY TEMPERATURE EXTREME, PIECE-PART FAILURE, SHORT OR OPEN, LOOSE CONNECTION/VIBRATION. ON LOSS OF THE ACTIVE PSP FL, THE REDUNDANT UNIT WOULD BE SELECTED. LOSS OF ALL CAPABILITY TO PROCESS/ROUTE PL CMDS COULD CAUSE LOSS OF MISSION.

REFERENCES: VS70-740239, SSSH 16.15, INCO/COMM SYS BRF 31, OMRSD V74 FILE III, JSC-12820 FLIGHT RULES SECTION 11

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/01/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 3012 ABORT: 3/3

ITEM: PAYLOAD SIGNAL PROCESSOR FORWARD LINK  
FAILURE MODE: ERRATIC OPERATION, INTERMITTENT OPERATION,  
PARTIAL OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) PSP FL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION:

PART NUMBER:

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

THE PSP'S PROVIDE TWO-WAY PROCESSING OF PL COMMANDS AND TELEMETRY DATA. THE FL SECTION PROCESSES PL COMMANDS AND ROUTES THEM EITHER TO THE ACTIVE PAYLOAD INTERROGATOR FOR RF FL (OR TO GSE UMBILICAL) OR VIA HARDLINE FOR ATTACHED PAYLOADS. PARTIAL OUTPUT (E.G., PARTIAL DATA REGISTER FAILURE CAUSING BIT DROP-OUT) OR ERRATIC/INTERMITTENT OPERATION COULD BE CAUSED BY TEMPERATURE EXTREME, PIECE-PART FAILURE, CONTAMINATION, LOOSE CONNECTION/VIBRATION. ON LOSS OF THE ACTIVE PSP FL, THE REDUNDANT UNIT WOULD BE SELECTED. LOSS OF ALL CAPABILITY TO PROCESS/ROUTE PL CMDS COULD CAUSE LOSS OF MISSION.

REFERENCES: VS70-740239, SSSH 16.15, INCO/COMM SYS BRF 31, OMRSD V74 FILE III, JSC-12820 FLIGHT RULES SECTION 11

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/29/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 3013 ABORT: 3/3

ITEM: PAYLOAD SIGNAL PROCESSOR RETURN LINK  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) PSP RL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 2  
PART NUMBER: MC476-0138-0001

CAUSES:

EFFECTS/RATIONALE:

THE PSP'S PROVIDE TWO-WAY DATA PROCESSING (PL COMMANDS AND TELEMETRY DATA). THE RL SECTION PROCESSES RF PL TELEMETRY DATA AND ROUTES IT TO THE PAYLOAD DATA INTERLEAVER. LOSS OF OUTPUT COULD BE CAUSED BY TEMPERATURE EXTREME, PIECE-PART FAILURE, SHORT OR OPEN, LOOSE CONNECTION/VIBRATION. ON LOSS OF THE ACTIVE PSP RL, THE REDUNDANT UNIT WOULD BE SELECTED. LOSS OF ALL CAPABILITY TO PROCESS/ROUTE PL TLM COULD CAUSE LOSS OF MISSION.

REFERENCES: VS70-740239, SSSH 16.15, INCO/COMM SYS BRF 31, OMRSD V74 FILE III, JSC-12820 FLIGHT RULES SECTION 11

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/29/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 3014 ABORT: 3/3

ITEM: PAYLOAD SIGNAL PROCESSOR RETURN LINK  
FAILURE MODE: ERRATIC OPERATION, INTERMITTENT OPERATION, PARTIAL  
OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) PSP RL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 2  
PART NUMBER: MC476-0138-0001

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

THE PSP'S PROVIDE TWO-WAY DATA PROCESSING (PL COMMANDS AND  
TELEMETRY). THE RL SECTION PROCESSES RF PL TELEMETRY DATA AND  
ROUTES IT TO THE PAYLOAD DATA INTERLEAVER. PARTIAL OUTPUT  
(REGISTER FAILURE CAUSING BIT DROP-OUT, FOR EXAMPLE) AND ERRATIC/  
INTERMITTENT OPERATION COULD BE CAUSED BY TEMPERATURE EXTREME,  
PIECE-PART FAILURE, CONTAMINATION, LOOSE CONNECTION/VIBRATION.  
ON LOSS OF THE ACTIVE PSP RL, THE REDUNDANT UNIT WOULD BE  
SELECTED. LOSS OF ALL CAPABILITY TO PROCESS/ROUTE PL TLM COULD  
CAUSE LOSS OF MISSION.

REFERENCES: VS70-740239, SSSH 16.15, INCO/COMM SYS BRP 31, OMRSD  
V74 FILE III, JSC-12820 FLIGHT RULES SECTION 11

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/29/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 3015 ABORT: 3/3

ITEM: S-BAND PAYLOAD SYSTEM PNL/CMD GCIL SWITCH  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, FAILS TO OPEN/CLOSE,  
PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL)

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) GCIL MODE SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: MC452-0102-7201

CAUSES:

EFFECTS/RATIONALE:

THE PNL/CMD SWITCH PERMITS PNL CONTROL OF THE PL SYSTEM IN PNL POSITION AND CONTROL VIA GCIL GROUND CMDS OR KYBD ENTRIES IN CMD POSITION. NORMAL OPNL MODE IS CMD. ON LOSS OF CAPABILITY TO MANAGE SYSTEM IN CMD MODE, PNL MODE WOULD BE SELECTED. LOSS OF ALL CAPABILITY TO CONTROL PL SYSTEM MODE/CONFIGURATION WOULD CAUSE LOSS OF MISSION.

REFERENCES: VS70-740239, SSSH 16.14, 16.15, INCO/COMM SYS BRIEF 31, 34, JSC-12820 FLIGHT RULES SECTION 11, OMRSD V74 FILE III

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/29/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 3016 ABORT: 3/3

ITEM: S-BAND PAYLOAD SYSTEM SELECT SWITCH, S13  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, FAILS MID-TRAVEL,  
FAILS TO OPEN/CLOSE, PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL),  
FAILS TO SWITCH

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) SYSTEM SELECT SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7403

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS 3-POSITION SWITCH (1/OFF/2) PERMITS PANEL CONTROL OF POWER TO SYS 1 OR SYS 2 WITH PL SYSTEM IN GCIL PNL MODE. OPNL REDUNDANCY EXISTS WITH SYSTEM IN GCIL CMD MODE. UPON LOSS OF POWER TO THE ACTIVE SYS, SWITCH COULD BE USED TO POWER REDUNDANT SYS. ON LOSS OF BOTH SWITCH PATHS SYSTEMS COULD BE POWERED IN GCIL CMD MODE (THE NORMAL MODE). LOSS OF ALL CAPABILITY TO POWER EITHER SYS EITHER BY PNL SWITCH OR GCIL GROUND CMD'S COULD CAUSE LOSS OF MAJOR MISSION OBJECTIVES.

REFERENCES: VS70-740239, SSSH 16.14, 16.15, INCO/COMM SYS BRIEF 31, 34, JSC-12820 FLIGHT RULES SECTION 11, OMRSD V74 FILE III

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/01/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 2/2  
MDAC ID: 3017 ABORT: 3/3

ITEM: S-BAND PAYLOAD SYSTEM SELECT SWITCH, S13  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) SYSTEM SELECT SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7403

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS 3-POSITION SWITCH (1/OFF/2) PERMITS PNL CONTROL OF PWR (BUSSES BC1, BC2) TO SYS 1 OR SYS 2 WITH PL SYS IN GCIL PNL MODE. A HARD SHORT TO GROUND IN SWITCH COULD BLOW THE 1 AMP FUSE FROM EACH BUS, DISABLING ALL PI/PSP FUNCTIONS IN PNL AND CMD MODES. NOTE: THERE ARE TWO CONTACTS IN THE SWITCH WITH DIRECT PATHS TO GROUND. THOSE CONTACTS PROVIDE GROUND FOR RECEIVED SIGNAL STRENGTH READINGS FOR PI 1 OR PI 2. LOSS OF CAPABILITY TO CONTROL PL SYS LRU'S WOULD CAUSE MISSION LOSS BECAUSE ATTACHED AND DETACHED PL CMD AND DETACHED PL TLM PATHS WOULD BE NON-FUNCTIONAL.

REFERENCES: VS70-740239, SSSH 16.14, 16.15, INCO/COMM SYS BRIEF 31, 34, JSC-12820 FLIGHT RULES SECTION 11, OMRSD V74 FILE III

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/02/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 3018 ABORT: 3/3

ITEM: S-BAND PL PI/PSP POWER SWITCH, S14  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, FAILS MID-TRAVEL,  
FAILS TO OPEN/CLOSE, PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL),  
FAILS TO SWITCH

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) PI/PSP POWER SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7406

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS 3-POSITION SWITCH (INTRG/BOTH/PSP) PERMITS PNL SELECTION OF PI ONLY, PSP ONLY, OR BOTH WITH PL SYS IN GCIL PNL MODE, WHEN PL SYS SELECT SWITCH IS IN SYS 1 OR SYS 2 POSITION. OPNL REDUNDANCY EXISTS FOR SAME CHOICES WITH PL SYS IN GCIL CMD MODE. ON LOSS OF PNL CONTROL, SYS COULD BE OPERATED IN CMD MODE (THE NORMAL MODE). LOSS OF ALL CAPABILITY TO POWER THE DESIRED LRUS COULD CAUSE LOSS OF MAJOR MISSION OBJECTIVES AND COULD CAUSE LOSS OF MISSION.

REFERENCES: VS70-740239, SSSH 16.14, 16.15, INCO/COMM SYS BRIEF 31, 34, JSC-12820 FLIGHT RULES SECTION 11, OMRSD V74 FILE III

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/02/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 2/2  
MDAC ID: 3019 ABORT: 3/3

ITEM: S-BAND PL PI/PSP POWER SWITCH, S14  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL COMM
- 3) PI/PSP POWER SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7406

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS 3-POSITION SWITCH (INTRG/BOTH/PSP) PERMITS PNL SELECTION OF PI ONLY, PSP ONLY, OR BOTH WITH PL SYS IN GCIL PNL MODE AND WHEN PL SYS SELECT SWITCH IS IN SYS 1 OR SYS 2 POSITION. A HARD SHORT TO GROUND IN THE SWITCH COULD BLOW THE 1 AMP FUSES FROM BUSES BC1, BC2, DISABLING ALL PI/PSP FUNCTIONS IN PNL AND CMD MODES. LOSS OF ALL CAPABILITY TO CONTROL PL SYS LRU'S WOULD CAUSE LOSS OF MISSION BECAUSE ATTACHED & DETACHED PL CMD AND DETACHED PL TLM PATHS WOULD BE NON-FUNCTIONAL.

REFERENCES: VS70-740239, SSSH 16.14, 16.15, INCO/COMM SYS BRIEF 31, 34, JSC-12820 FLIGHT RULES SECTION 11, OMRSD V74 FILE III

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/02/87  
SUBSYSTEM: COMM & TRACK  
MDAC ID: 3020

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 3/3

ITEM: S-BAND PL ANTENNA POLARIZATION SWITCH, S2  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, FAILS MID-TRAVEL,  
FAILS TO OPEN/CLOSE, PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL),  
FAILS TO SWITCH

LEAD ANALYST: A.W. ADDIS

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) ANTENNA POLARIZATION SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: 36V73A1A2S2

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS SWITCH PERMITS PNL SELECTION OF RIGHT-HAND CIRCULARLY POLARIZED OR LEFT-HAND CP RF RADIATION/RECEPTION BY PL ANTENNA WITH PL SYS IN GCIL PNL MODE. OPNL REDUNDANCY EXISTS FOR SELECTION WITH SYS IN GCIL CMD MODE (NORMAL OPNL MODE). ON LOSS OF ABILITY TO SELECT POLARIZATION VIA PNL, CMD MODE COULD BE USED. LOSS OF ALL CAPABILITY TO SELECT POLARIZATION COMPATIBLE WITH DETACHED PL COULD CAUSE LOSS OF MAJOR MISSION OBJECTIVES FOR PL'S REQUIRING PRE-DEPLOY CHECKOUT AND POST-DEPLOY OPS VIA RF.

REFERENCES: VS70-740239, SSSH 16.14, 16.15, INCO/COMM SYS BRIEF 31, 34, JSC-12820 FLIGHT RULES SECTION 11, OMRSD V74 FILE III

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/02/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 2/2  
MDAC ID: 3021 ABORT: 3/3

ITEM: S-BAND PL ANTENNA POLARIZATION SWITCH, S2  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) ANTENNA POLARIZATION SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: 36V73A1A3S2

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS SWITCH PERMITS PNL SELECTION OF RIGHT-HAND CIRCULARLY POLARIZED OR LEFT-HAND CP RF RADIATION/RECEPTION BY ANTENNA WITH PL SYS IN GCIL PNL MODE. A HARD SHORT TO GROUND IN THE SWITCH COULD BLOW THE 3-AMP FUSES PROTECTING MNB, MNC OUTPUTS OF FLCA2, FLCA3, DISABLING ALL MODE/CONFIGURATION CONTROLS FOR PL SYS IN PNL AND CMD MODES. LOSS OF ALL CAPABILITY TO CONTROL PL SYS WOULD CAUSE LOSS OF MISSION.

REFERENCES: VS70-740239, SSSH 16.14, 16.15, INCO/COMM SYS BRIEF 31, 34, JSC-12820 FLIGHT RULES SECTION 11, OMRSD V74 FILE III

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/06/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 3022 ABORT: 3/3

ITEM: PI TRANSMITTER RF PWR LEVEL SELECT SWITCH, S4  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, FAILS TO OPEN/CLOSE,  
PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL)

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) PI XMTR
- 4) POWER OUTPUT LEVEL SELECT SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7206

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS SWITCH PERMITS PNL SELECTION OF PI RF OUTPUT PWR LEVEL (HIGH/MED/LOW) WITH PL SYS IN GCIL PNL MODE. ALTERNATE SYS OPNL MODE IS GCIL CMD MODE, GIVING SYS CONTROL TO GROUND OR SSO KYBD. WITH BINDING/JAMMING OR OPEN CIRCUIT PREVENTING PNL CONTROL, GCIL CMD MODE WOULD BE SELECTED. LOSS OF ALL CAPABILITY TO CONTROL RF PWR OUTPUT LEVEL OF PI XMTR COULD CAUSE LOSS OF MAJOR MISSION OBJECTIVES FOR SOME FLIGHTS.

REFERENCES: INT SYS SCHEM VS70-974099; SSSH16.14, 16.15;  
INCO/COMM SYS BRFS 31, 34; JSC-12820 FLT RULES SECT 11; OMRSN V74  
FILE III

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/07/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 2/2  
MDAC ID: 3023 ABORT: 3/3

ITEM: PI TRANSMITTER RF PWR LEVEL SELECT SWITCH, S4  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) PI XMTR
- 4) POWER OUTPUT LEVEL SELECT SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7206

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS SWITCH PERMITS PNL SELECTION OF PI RF OUTPUT PWR LEVEL (HIGH/MED/LOW) WITH PL SYS IN GCIL PNL MODE. ALTERNATE SYS OPNL MODE IS GCIL CMD MODE, GIVING SYS CONTROL TO GROUND OR SSO KYBD. A HARD SHORT TO GROUND IN THE SWITCH COULD BLOW THE 3-AMP FUSES PROTECTING MNB, MNC OUTPUTS OF FLCA 2, FLCA 3, DISABLING ALL MODE/CONFIG CONTROLS FOR PL SYS IN PNL & CMD MODES. LOSS OF ALL CAPABILITY TO CONTROL PL SYS WOULD CAUSE LOSS OF MISSION REQUIRING RF COMM WITH A PL.

REFERENCES: VS70-740239, SSSH 16.14, INCO/COMM SYS BRF 31, OMRSD V74 FILE III, JSC12820 FLIGHT RULES SECTION 11

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/07/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 3024 ABORT: 3/3

ITEM: PL SYSTEM XMTR MODULATION ON/OFF SWITCH, S9  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, FAILS MID-TRAVEL,  
FAILS TO OPEN/CLOSE, PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL),  
FAILS TO SWITCH

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) PI XMTR
- 4) MODULATION ON/OFF SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/2R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7201

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

WITH PL SYS IN GCIL PNL MODE THIS SWITCH (MODULATION ON/OFF) PERMITS CREW REMOVAL OF MODULATION ON PI FL RF TO ASSIST A PL WITH RF SWEEP RECEIVER TO ACQUIRE AND LOCK ONTO THE PI XMTR UNMODULATED FL RF CARRIER SIGNAL, AND TO PREVENT FALSE LOCK ON A SIDEBAND. UPON LOSS OF PNL ON/OFF CONTROL OF MODULATION OF THE FL RF CARRIER FOR BOTH PI'S GCIL CMD MODE WOULD BE SELECTED. LOSS OF ALL CAPABILITY TO REMOVE MODULATION ON THE FL RF COULD PREVENT PL RCVR FROM ACQUIRING AND LOCKING ONTO THE SIGNAL, AND COULD CAUSE LOSS OF MISSION REQUIRING RF COMM WITH A PL.

REFERENCES: VS70-740239, SSSH 16.14, INCO/COMM SYS BRF 31, OMRSD V74 FILE III, JSC12820 FLIGHT RULES SECTION 11

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/07/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 2/2  
MDAC ID: 3025 ABORT: 3/3

ITEM: PL SYSTEM XMTR MODULATION ON/OFF SWITCH, S9  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) PI XMTR
- 4) MODULATION ON/OFF SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7201

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

WITH PL SYS IN GCIL PNL MODE THIS SWITCH (MODULATION ON/OFF) PERMITS CREW REMOVAL OF MODULATION ON PI FL RF TO ASSIST A PL WITH RF SWEEP RECEIVER TO ACQUIRE AND LOCK ONTO THE PI XMTR UNMODULATED FL RF SIGNAL. A HARD SHORT TO GROUND IN THE SWITCH COULD BLOW THE 3-AMP FUSES PROTECTING MNB, MNC OUTPUTS OF FLCA 2, FLCA 3, DISABLING ALL MODE/CONFIG CONTROLS FOR PL SYS IN PNL & CMD MODES. LOSS OF ALL CAPABILITY TO CONTROL PL SYS WOULD CAUSE LOSS OF MISSION.

REFERENCES: VS70-740239, SSSH 16.14, INCO/COMM SYS BRP 31, OMRSD V74 FILE III, JSC12820 FLIGHT RULES SECTION 11

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/07/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 3026 ABORT: 3/3

ITEM: S-BAND PL FREQUENCY SWEEP ON/OFF SWITCH, S8  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, FAILS MID-TRAVEL,  
FAILS TO OPEN/CLOSE, PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL),  
FAILS TO SWITCH

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) PI XMTR
- 4) FREQ SWEEP ON/OFF SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES	
FLIGHT PHASE	HDW/FUNC	ABORT
PRELAUNCH:	3/3	RTLS: 3/3
LIFTOFF:	3/3	TAL: 3/3
ONORBIT:	3/2R	AOA: 3/3
DEORBIT:	3/3	ATO: 3/3
LANDING/SAFING:	3/3	

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7202

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

WITH PL SYS IN GCIL PNL MODE THIS SWITCH (SWEEP ON/OFF) PERMITS CREW TO SWEEP FREQUENCY OF ACTIVE PI XMTR RF OUTPUT TO ALLOW NON-SWEEP PL RCVR TO ACQUIRE/LOCK ONTO THE PI FL RF SIGNAL. UPON LOSS OF PNL CONTROL OF FREQ SWEEP FOR BOTH PI'S GCIL CMD MODE WOULD BE SELECTED. LOSS OF ALL CAPABILITY TO PROVIDE FL RF FREQ SWEEP COULD PREVENT PL RCVR FROM ACQUIRING & LOCKING ONTO THE SIGNAL, AND COULD CAUSE LOSS OF MISSION REQUIRING RF COMM WITH A PL.

REFERENCES: VS70-740239, SSSH 16.14, INCO/COMM SYS BR 31, OMRSD V74 FILE III, JSC12820 FLIGHT RULES SECTION 11

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/07/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK, FLIGHT: 2/2  
MDAC ID: 3027 ABORT: 3/3

ITEM: S-BAND FREQUENCY SWEEP ON/OFF SWITCH, S8  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) PI XMTR
- 4) FREQ SWEEP ON/OFF SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7202

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

WITH PL SYS IN GCIL PNL MODE THIS SWITCH (SWEEP ON/OFF) PERMITS CREW TO SWEEP FREQUENCY OF ACTIVE PI XMTR RF OUTPUT TO ALLOW NON-SWEEP PL RCVR TO ACQUIRE/LOCK ONTO THE PI FL RF SIGNAL. A HARD SHORT TO GROUND IN SWITCH COULD BLOW THE 3-AMP FUSES PROTECTING MNB, MNC OUTPUTS OF FLCA 2, FLCA 3, DISABLING ALL MODE/CONFIG CONTROLS FOR PL SYS IN PNL & CMD MODES. LOSS OF CAPABILITY TO CONTROL PL SYS WOULD CAUSE LOSS OF MISSION.

REFERENCES: VS70-740239, SSSH 16.14, INCO/COMM SYS BR 31, OMRSD V74 FILE III, JSC12820 FLIGHT RULES SECTION 11

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87  
SUBSYSTEM: COMM & TRACK  
MDAC ID: 3028

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 3/3

ITEM: S-BAND PL PSP COMMAND OUTPUT SELECTOR SWITCH, S15  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, FAILS MID-TRAVEL,  
FAILS TO OPEN/CLOSE, PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL),  
FAILS TO SWITCH

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) PAYLOAD SIGNAL PROCESSOR
- 4) OUTPUT ROUTING SELECTOR SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7201

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

WITH PL SYS IN GCIL PNL MODE THIS SWITCH PERMITS PNL SELECTION OF PSP COMMAND ROUTING EITHER VIA PL UMBILICAL FOR CMDS TO ATTACHED PL'S VIA HARDLINE OR TO PI XMTR FOR CMD'S TO DETACHED PL'S VIA RF. ALTERNATE OPNL MODE IS GCIL CMD MODE FOR ROUTING SELECTION BY GROUND CMD'S OR SSO KYBD. LOSS OF ALL CAPABILITY FOR SELECTION OF PL CMD ROUTING BECAUSE OF OPEN OR JAMMING DUE TO CONTAMINATION OR PART FAILURE COULD CAUSE LOSS OF MISSION.

REFERENCES: VS70-740239, SSSH 16.15, INCO/COMM SYS BRF 31, OMRSD V74 FILE III, JSC12820 FLIGHT RULES SECTION 11

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 2/2  
MDAC ID: 3029 ABORT: 3/3

ITEM: S-BAND PL PSP COMMAND OUTPUT SELECTOR SWITCH, S15  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) PAYLOAD SIGNAL PROCESSOR
- 4) OUTPUT ROUTING SELECTOR SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0102-7201

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

WITH PL SYS IN GCIL PNL MODE THIS SWITCH PERMITS PNL SELECTION OF PSP COMMAND ROUTING EITHER VIA PL UMBILICAL FOR CMD'S TO ATTACHED PLS VIA HARDLINE OR TO PI XMTR FOR CMD'S TO DETACHED PL'S VIA RF. A HARD SHORT TO GROUND IN SWITCH COULD BLOW THE 3-AMPFUSES PROTECTING MNB, MNC OUTPUTS OF FLCA 2, FLCA 3, DISABLING ALL MODE/CONFIGURATION CONTROLS FOR PL SYS IN PNL AND CMD MODES. LOSS OF ALL CAPABILITY TO CONTROL PL SYSTEM WOULD CAUSE LOSS OF MISSION.

REFERENCES: VS70-740239, SSSH 16.15, INCO/COMM SYS BRf 31, OMRSD V74 FILE III, JSC12820 FLIGHT RULES SECTION 11

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 3030 ABORT: 3/3

ITEM: S-BAND PL SYSTEM PI RF CHANNEL SELECT SWITCHES, S7  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, FAILS MID-TRAVEL,  
FAILS TO OPEN/CLOSE, PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL),  
FAILS TO SWITCH

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) PAYLOAD INTERROGATOR
- 4) RF CHANNEL SELECT SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0134-2009

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

WITH PL SYS IN GCIL PNL MODE THE TWO SETS OF THUMB-WHEEL SWITCHES PERMIT PNL SELECTION OF PI XMTR/RCVR RF CH FREQ PAIRS. ONE SWITCH SET IS DEDICATED TO PI 1, OTHER TO PI 2. ALTERNATE OPNL MODE FOR RF CH SELECT IS WITH PL SYS IN GCIL CMD MODE GIVING CONTROL TO GROUND OR SSO KYBD. ON LOSS OF PNL CONTROL OF ACTIVE PI RF CH SELECT DUE TO OPEN CIRCUIT OR JAMMING, REDUNDANT SWITCH SET (AND PI) WOULD BE USED. ON LOSS OF ALL CAPABILITY FOR PNL CONTROL, CMD MODE WOULD BE USED. LOSS OF ALL CAPABILITY TO CONTROL PI RF CH BY PNL OR CMD COULD CAUSE MISSION LOSS FOR FLIGHTS REQUIRING RF COMM WITH PL.

REFERENCES: VS70-740239, SSSH 16.14, INCO/COMM SYS BRF 31, OMRSD V74 FILE III, JSC12820 FLIGHT RULES SECTION 11

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 3031 ABORT: 3/3

ITEM: S-BAND PL SYSTEM PI RF CHANNEL SELECT SWITCHES  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) S-BAND PL SYSTEM
- 3) PAYLOAD INTERROGATOR
- 4) RF CHANNEL SELECT SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: ME452-0134-2009

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

WITH PL SYS IN GCIL PNL MODE THE TWO SETS OF THUMB-WHEEL SWITCHES PERMIT PNL SELECTION OF PI XMTR/RCVR RF CH FREQ PAIRS. ONE SWITCH IS DEDICATED TO PI 1, THE OTHER TO PI 2. ALTERNATE OPNL MODE FOR RF CH SELECT IS WITH PL SYS IN GCIL CMD MODE, GIVING CONTROL TO GROUND OR SSO KYBD. ON LOSS OF PNL CONTROL OF ACTIVE PI RF CH SELECT DUE TO SHORT IN SWITCH, REDUNDANT SWITCH SET (AND PI) WOULD BE USED. LOSS OF ALL CAPABILITY TO CONTROL PI RF CH BY PNL OR CMD COULD CAUSE MISSION LOSS FOR FLIGHTS REQUIRING RF COMM WITH PL.

REFERENCES: VS70-740239, SSSH 16.14, INCO/COMM SYS BRF 31, OMRSD V74 FILE III, JSC12820 FLIGHT RULES SECTION 11

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3501 ABORT: 3/2R

ITEM: FUSE, 3A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD INTERROGATOR
- 2) MNBFLC3 BUS
- 3) 10A FUSE
- 4) DRIVER
- 5) 3A FUSE
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

P/L INTRG NO. 2 WOULD BE POWERED ON BUT ASSOCIATED FUNCTIONS  
CONTROLLED BY PNL SWITCHES AND GCIL LOST INCLUDE: INTRG 2  
CHANNEL SELECTION; XMTR 1 PWR LEVEL SELECT; INTRG 2 MODULATOR PWR  
AND XMTR FREQUENCY SWEEP INCLUDING GCIL SELECT OF WIDE AND  
NARROW ALSO, PARTIAL LOSS OF S-BAND PAYLOAD ANTENNA POLARIZATION  
CONFIG. REDUNDANCY PROVIDED BY PARALLEL FUSE SUPPLYING 28VDC TO  
P/L INTRG 2. SINGLE FAILURE WOULD HAVE NO EFFECT ON  
MISSION/CREW/VEHICLE. FAILURE OF ALL REDUNDANCY WOULD CAUSE LOSS  
OF COMMAND/DATA FUNCTIONS OF PAYLOAD AND LIKELY RESULT IN LOSS OF  
MISSION.

REFERENCES: SSSH 16.14, SYST CHEM VS70-740239



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/06/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3502 ABORT: 3/2R

ITEM: FUSE, 1A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD INTERROGATOR
- 2) CNTLBC1 BUS
- 3) 1A FUSE, F4
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF P/L INTERROGATOR NO. 1 ON COMMAND FROM PANEL SWITCH AND GCIL. LOSS OF: CAPABILITY TO CMD ON THE COMBINATION OF BOTH P/L INTRG 1 AND P/L SIGNAL PROCESSOR 1; P/L INTRG 1 GCIL COMMAND POWER SIGNALS; 28VDC P/L INTRG 1 SIGNAL TO KU-BAND SIGNAL PROCESSOR AND THE P/L STATION DISTRIBUTION PANEL. REDUNDANCY PROVIDED BY PARALLEL FUSE SUPPLYING 28VDC TO CONTROL INTRG 2. SINGLE FAILURE WOULD HAVE NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.14, SYST SCHEM VS70-740239

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/06/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3503 ABORT: 3/2R

ITEM: FUSE, 1A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD INTERROGATOR
- 2) CNTLBC2 BUS
- 3) 1A FUSE, F11
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF P/L INTERROGATOR NO. 2 ON COMMAND FROM PANEL SWITCH AND GCIL. LOSS OF: CAPABILITY TO CMD ON THE COMBINATION OF BOTH P/L INTRG 2 AND P/L SIGNAL PROCESSOR 2; P/L INTRG 2 GCIL COMMAND POWER SIGNALS; 28VDC P/L INTRG 2 SIGNAL TO KU-BAND SIGNAL PROCESSOR AND THE P/L STATION DISTRIBUTION PANEL. FAILURE OF ALL REDUNDANCY WOULD CAUSE LOSS OF COMMAND/DATA FUNCTIONS OF PAYLOAD AND LIKELY RESULT IN LOSS OF MISSION.

REFERENCES: SSSH 16.14, SYST SCHEM VS70-740239

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3504 ABORT: 3/2R

ITEM: FUSE, 1A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD INTERROGATOR
- 2) CNTLBC1 BUS
- 3) 1A FUSE, F3
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF P/L SIGNAL PROCESSOR NO. 1 ON COMMAND FROM PANEL SWITCH  
AND GCIL. LOSS OF: PSP NO. 1 COMMAND POWER TO GCIL; CAPABILITY  
TO CMD ON THE COMBINATION OF BOTH PSP NO. 1 AND P/L INTRG NO. 1;  
PANEL SWITCH AND GCIL SELECTION OF P/L INTRG OR P/L  
UMBILICAL FOR THE PSP CMD OUTPUT. REDUNDANCY PROVIDED BY  
PARALLEL FUSE SUPPLYING 28VDC TO P/L SIGNAL PROCESSOR NO. 2.  
SINGLE FAILURE WOULD HAVE NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.14, 16.15, SYST SCHEM VS70-740239

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3505 ABORT: 3/2R

ITEM: FUSE, 1A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD INTERROGATOR
- 2) CNTLBC2 BUS
- 3) 1A FUSE, F10
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF P/L SIGNAL PROCESSOR NO. 2 ON COMMAND FROM PANEL SWITCH  
AND GCIL. LOSS OF: PSP NO. 2 COMMAND POWER TO GCIL; CAPABILITY  
TO CMD ON THE COMBINATION OF BOTH PSP NO. 2 AND P/L INTRG NO. 2;  
PANEL SWITCH AND GCIL SELECTION OF P/L INTRG OR P/L  
UMBILICAL FOR THE PSP CMD OUTPUT. FAILURE OF ALL REDUNDANCY  
WOULD CAUSE LOSS OF COMMAND/DATA FUNCTIONS OF PAYLOAD AND LIKELY  
RESULT IN LOSS OF MISSION.

REFERENCES: SSSH 16.14, 16.15, SYST SCHEM VS70-740239

REPORT DATE 12/31/87

C-300

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3506 ABORT: 3/2R

ITEM: FUSE, 10A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD INTERROGATOR
- 2) MNBFLC2 BUS
- 3) 10A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/2R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/2R	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 2  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF P/L INTRG NO. 1 POWER SUPPLY. ALSO, LOSS OF: THE P/L  
INTRG 1 SIGNAL TO KU-BAND SIGNAL PROCESSOR; 28VDC TO P/L STATION  
DISTRIBUTION PANEL; PARTIAL LOSS OF S-BAND P/L ANTENNA  
POLARIZATION CONTROL; AND, LOSS OF SWITCH CONTROL OF SEVERAL  
FUNCTIONS WITHIN P/L INTRG 1. REDUNDANCY PROVIDED BY PARALLEL  
FUSE SUPPLYING 28VDC TO POWER P/L INTRG 2 AND ASSOCIATED  
FUNCTIONS. SINGLE FAILURE WOULD HAVE NO EFFECT ON  
MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.14, SYST SCHEM VS70-740239

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3507 ABORT: 3/2R

ITEM: FUSE, 10A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD INTERROGATOR
- 2) MNCFLC3 BUS
- 3) 10A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 3  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF P/L INTRG NO. 2 POWER SUPPLY. ALSO, LOSS OF: THE P/L  
INTRG 2 SIGNAL TO KU-BAND SIGNAL PROCESSOR; 28VDC TO P/L STATION  
DISTRIBUTION PANEL; PARTIAL LOSS OF S-BAND P/L ANTENNA  
POLARIZATION CONTROL; AND, LOSS OF SWITCH CONTROL OF SEVERAL  
FUNCTIONS WITHIN P/L INTRG 2. FAILURE OF ALL REDUNDANCY WOULD  
CAUSE LOSS OF COMMAND/DATA FUNCTIONS OF PAYLOAD AND LIKELY RESULT  
IN LOSS OF MISSION.

REFERENCES: SSSH 16.14, SYST SCHEM VS70-740239

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3508 ABORT: 3/2R

ITEM: FUSE, 3A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD INTERROGATOR
- 2) MNBFLC2 BUS
- 3) 10A FUSE
- 4) DRIVER
- 5) 3A FUSE
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 2  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

P/L INTRG NO. 1 WOULD BE POWERED ON BUT ASSOCIATED FUNCTIONS  
CONTROLLED BY PNL SWITCHES AND GCIL LOST INCLUDE: INTRG 1  
CHANNEL SELECTION; XMTR 1 PWR LEVEL SELECT; INTRG 1 MODULATOR PWR  
AND XMTR FREQUENCY SWEEP INCLUDING GCIL SELECT OF WIDE AND  
NARROW. ALSO, PARTIAL LOSS OF S-BAND PAYLOAD ANTENNA  
POLARIZATION CONFIG. REDUNDANCY PROVIDED BY PARALLEL FUSE  
SUPPLYING 28VDC TO P/L INTRG 2. SINGLE FAILURE WOULD HAVE NO  
EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.14, SYST SCHEM VS70-740239

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3509 ABORT: 3/2R

ITEM: FUSE, 3A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD INTERROGATOR
- 2) MNCFLC3 BUS
- 3) 10A FUSE
- 4) DRIVER
- 5) 3A FUSE
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 3  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

P/L INTRG NO. 2 WOULD BE POWERED ON BUT ASSOCIATED FUNCTIONS  
CONTROLLED BY PNL SWITCHES AND GCIL LOST INCLUDE: INTRG 2  
CHANNEL SELECTION; XMTR 1 PWR LEVEL SELECT; INTRG 2 MODULATOR PWR  
AND XMTR FREQUENCY SWEEP INCLUDING GCIL SELECT OF WIDE AND  
NARROW. ALSO, PARTIAL LOSS OF S-BAND PAYLOAD ANTENNA  
POLARIZATION CONFIG. FAILURE OF ALL REDUNDANCY WOULD  
CAUSE LOSS OF COMMAND/DATA FUNCTIONS OF PAYLOAD AND LIKELY RESULT  
IN LOSS OF MISSION.

REFERENCES: SSSH 16.14, SYST SCHEM VS70-740239



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3510 ABORT: 3/2R

ITEM: FUSE, 10A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD INTERROGATOR
- 2) MNBFLC2 BUS
- 3) 10A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 2  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF PNL SWITCH AND GCIL SELECTION OF RIGHT CIRCULAR  
POLARIZATION OF S-BAND P/L ANTENNA IN CONJUNCTION WITH INTRG 1  
USE. SELECTION OF LEFT CIRCULAR POLARIZATION REMAINS AVAILABLE.  
NO REDUNDANCY FOR THIS ITEM/FUNCTION (WITH INTRG 1), HOWEVER,  
BOTH LEFT/RIGHT POLARIZATION REMAIN AVAILABLE IN CONJUNCTION WITH  
INTRG 2. FIRST FAILURE WOULD HAVE NO EFFECT ON MISSION, CREW,  
VEHICLE. FAILURE OF SECOND FUSE IN CIRCUIT SELECTING RHCP (WITH  
INTRG 2) RESULTS IN LOSS OF ALL CAPABILITY TO SELECT RHCP  
FOR S-BAND P/L ANTENNA AND MAY CAUSE LOSS OF MISSION.

REFERENCES: SSSH 16.14, SYST SCHEM VS70-740239

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3511 ABORT: 3/2R

ITEM: FUSE, 10A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD INTERROGATOR
- 2) MNBFLC2 BUS
- 3) 10A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/2R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/2R	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 2  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF PNL SWITCH AND GCIL SELECTION OF LEFT CIRCULAR  
POLARIZATION OF S-BAND P/L ANTENNA IN CONJUNCTION WITH INTRG 1  
USE. SELECTION OF RIGHT CIRCULAR POLARIZATION REMAINS AVAILABLE.  
NO REDUNDANCY FOR THIS ITEM/FUNCTION (WITH INTRG 1), HOWEVER,  
BOTH LEFT/RIGHT POLARIZATION REMAIN AVAILABLE IN CONJUNCTION WITH  
INTRG 2. FIRST FAILURE WOULD HAVE NO EFFECT ON MISSION, CREW,  
VEHICLE. FAILURE OF SECOND FUSE IN CIRCUIT SELECTING LHCP (WITH  
INTRG 2) RESULTS IN LOSS OF ALL CAPABILITY TO SELECT LHCP  
FOR S-BAND P/L ANTENNA AND MAY CAUSE LOSS OF MISSION.

REFERENCES: SSSH 16.14, SYST SCHEM VS70-740239

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3512 ABORT: 3/2R

ITEM: FUSE, 10A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD INTERROGATOR
- 2) MNCFLC3 BUS
- 3) 10A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 3  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF PNL SWITCH AND GCIL SELECTION OF RIGHT CIRCULAR  
POLARIZATION OF S-BAND P/L ANTENNA IN CONJUNCTION WITH INTRG 2  
USE. SELECTION OF LEFT CIRCULAR POLARIZATION REMAINS AVAILABLE.  
FAILURE OF THIS SECOND FUSE RESULTS IN LOSS OF ALL CAPABILITY TO  
SELECT RHCP FOR S-BAND P/L ANTENNA AND MAY CAUSE LOSS OF MISSION.

REFERENCES: SSSH 16.14, SYST SCHEM VS70-740239

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3513 ABORT: 3/2R

ITEM: FUSE, 10A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD INTERROGATOR
- 2) MNCFLC3 BUS
- 3) 10A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 3  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF PNL SWITCH AND GCIL SELECTION OF LEFT CIRCULAR  
POLARIZATION OF S-BAND P/L ANTENNA IN CONJUNCTION WITH INTRG 2  
USE. SELECTION OF RIGHT CIRCULAR POLARIZATION REMAINS AVAILABLE.  
FAILURE OF THIS SECOND FUSE RESULTS IN LOSS OF ALL CAPABILITY TO  
SELECT LHCP FOR S-BAND P/L ANTENNA AND MAY CAUSE LOSS OF MISSION.

REFERENCES: SSSH 16.14, SYST SCHEM VS70-740239

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3514 ABORT: 3/2R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD INTERROGATOR
- 2) MNBFLC2 BUS
- 3) 10A FUSE
- 4) DRIVER
- 5) DIODE
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF PNL SWITCH AND GCIL SELECTION OF RIGHT CIRCULAR  
POLARIZATION OF S-BAND P/L ANTENNA IN CONJUNCTION WITH INTRG 1  
USE. SELECTION OF LEFT CIRCULAR POLARIZATION REMAINS AVAILABLE.  
NO REDUNDANCY FOR THIS ITEM/FUNCTION (WITH INTRG 1), HOWEVER,  
BOTH LEFT/RIGHT POLARIZATION REMAIN AVAILABLE IN CONJUNCTION WITH  
INTRG 2. FIRST FAILURE WOULD HAVE NO EFFECT ON MISSION, CREW,  
VEHICLE. FAILURE OF SECOND DIODE IN CIRCUIT SELECTING RHCP (WITH  
INTRG 2) RESULTS IN LOSS OF ALL CAPABILITY TO SELECT RHCP  
FOR S-BAND P/L ANTENNA AND MAY CAUSE LOSS OF MISSION.

REFERENCES: SSSH 16.14, SYST SCHEM VS70-740239

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3515 ABORT: 3/2R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD INTERROGATOR
- 2) MNBFLC2 BUS
- 3) 10A FUSE
- 4) DRIVER
- 5) DIODE
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF PNL SWITCH AND GCIL SELECTION OF LEFT CIRCULAR  
POLARIZATION OF S-BAND P/L ANTENNA IN CONJUNCTION WITH INTRG 1  
USE. SELECTION OF RIGHT CIRCULAR POLARIZATION REMAINS AVAILABLE.  
NO REDUNDANCY FOR THIS ITEM/FUNCTION (WITH INTRG 1), HOWEVER,  
BOTH LEFT/RIGHT POLARIZATION REMAIN AVAILABLE IN CONJUNCTION WITH  
INTRG 2. FIRST FAILURE WOULD HAVE NO EFFECT ON MISSION, CREW,  
VEHICLE. FAILURE OF SECOND DIODE IN CIRCUIT SELECTING LHCP (WITH  
INTRG 2) RESULTS IN LOSS OF ALL CAPABILITY TO SELECT LHCP  
FOR S-BAND P/L ANTENNA AND MAY CAUSE LOSS OF MISSION.

REFERENCES: SSSH 16.14, SYST SCHEM VS70-740239

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3516 ABORT: 3/2R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD INTERROGATOR
- 2) MNCFLC3 BUS
- 3) 10A FUSE
- 4) DRIVER
- 5) DIODE
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 3  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF PNL SWITCH AND GCIL SELECTION OF RIGHT CIRCULAR  
POLARIZATION OF S-BAND P/L ANTENNA IN CONJUNCTION WITH INTRG 2  
USE. SELECTION OF LEFT CIRCULAR POLARIZATION REMAINS AVAILABLE.  
FAILURE OF THIS SECOND DIODE RESULTS IN LOSS OF ALL CAPABILITY TO  
SELECT RHCP FOR S-BAND P/L ANTENNA AND MAY CAUSE LOSS OF MISSION.

REFERENCES: SSSH 16.14, SYST SCHEM VS70-740239

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3517 ABORT: 3/2R

ITEM: DIODE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD INTERROGATOR
- 2) MNCFLC3 BUS
- 3) 10AFUSE
- 4) DRIVER
- 5) DIODE
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 3  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF PNL SWITCH AND GCIL SELECTION OF LEFT CIRCULAR  
POLARIZATION OF S-BAND P/L ANTENNA IN CONJUNCTION WITH INTRG 2  
USE. SELECTION OF RIGHT CIRCULAR POLARIZATION REMAINS AVAILABLE.  
FAILURE OF THIS SECOND DIODE RESULTS IN LOSS OF ALL CAPABILITY TO  
SELECT LHCP FOR S-BAND P/L ANTENNA AND MAY CAUSE LOSS OF MISSION.

REFERENCES: SSSH 16.14, SYST SCHEM VS70-740239



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3518 ABORT: 3/2R

ITEM: FUSE, 3A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD SIGNAL PROCESSOR
- 2) MNBFLC2 BUS
- 3) 3A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 2  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC ON POWER TO P/L SIGNAL PROCESSOR (PSP) NO. 1.  
ALSO, LOSS OF INPUT TO PNL SWITCH CONTROLLING SELECTION OF P/L  
INTRG OR P/L UMBILICAL FOR THE PSP CMD OUTPUTS. REDUNDANCY  
PROVIDED BY PARALLEL FUSE SUPPLYING 28VDC TO PSP 2 AND PNL  
SWITCH. SINGLE FAILURE WOULD HAVE NO EFFECT ON  
MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.15, SYST SCHEM VS70-740239

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3519 ABORT: 3/2R

ITEM: FUSE, 3A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD SIGNAL PROCESSOR
- 2) MNCFLC3 BUS
- 3) 3A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 3  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC ON POWER TO P/L SIGNAL PROCESSOR (PSP) NO. 2.  
ALSO, LOSS OF INPUT TO PNL SWITCH CONTROLLING SELECTION OF P/L  
INTRG OR P/L UMBILICAL FOR THE PSP CMD OUTPUTS. FAILURE OF ALL  
REDUNDANCY WOULD CAUSE LOSS OF BOTH P/L SIGNAL PROCESSORS AND  
LIKELY CAUSE LOSS OF MISSION.

REFERENCES: SSSH 16.15, SYST SCHEM VS70-740239

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/14/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3520 ABORT: 3/2R

ITEM: DRIVER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD SIGNAL PROCESSOR
- 2) MNBFLC2 BUS
- 3) 3A FUSE
- 4) DRIVER
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC ON POWER TO P/L SIGNAL PROCESSOR (PSP) NO. 1.  
ALSO, LOSS OF INPUT TO PNL SWITCH CONTROLLING SELECTION OF P/L  
INTRG OR P/L UMBILICAL FOR THE PSP CMD OUTPUTS. REDUNDANCY  
PROVIDED BY PARALLEL DRIVER SUPPLYING 28VDC TO PSP 2 AND PNL  
SWITCH. SINGLE FAILURE WOULD HAVE NO EFFECT ON  
MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.15, SYST SCHEM VS70-740239

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/14/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3521 ABORT: 3/2R

ITEM: DRIVER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD SIGNAL PROCESSOR
- 2) MNCFLC3 BUS
- 3) 3A FUSE
- 4) DRIVER
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 3  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28VDC ON POWER TO P/L SIGNAL PROCESSOR (PSP) NO. 2.  
ALSO, LOSS OF INPUT TO PNL SWITCH CONTROLLING SELECTION OF P/L  
INTRG OR P/L UMBILICAL FOR THE PSP CMD OUTPUTS. FAILURE OF ALL  
REDUNDANCY WOULD CAUSE LOSS OF BOTH P/L SIGNAL PROCESSORS AND  
LIKELY CAUSE LOSS OF MISSION.

REFERENCES: SSSH 16.15, SYST SCHEM VS70-740239

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/14/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3522 ABORT: 3/2R

ITEM: DRIVER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD INTERROGATOR
- 2) MNBFLC2 BUS
- 3) 10AFUSE
- 4) DRIVER
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF P/L INTRG NO. 1 POWER SUPPLY. ALSO, LOSS OF: THE P/L  
INTRG 1 SIGNAL TO KU-BAND SIGNAL PROCESSOR; 28VDC TO P/L STATION  
DISTRIBUTION PANEL; PARTIAL LOSS OF S-BAND P/L ANTENNA  
POLARIZATION CONTROL; AND, LOSS OF SWITCH CONTROL OF SEVERAL  
FUNCTIONS WITHIN P/L INTRG 1. REDUNDANCY PROVIDED BY PARALLEL  
DRIVER SUPPLYING 28VDC TO POWER P/L INTRG 2 AND ASSOCIATED  
FUNCTIONS. SINGLE FAILURE WOULD HAVE NO EFFECT ON  
MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.14, SYST SCHEM VS70-740239

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/14/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3523 ABORT: 3/2R

ITEM: DRIVER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD INTERROGATOR
- 2) MNCFLC3 BUS
- 3) 10AFUSE
- 4) DRIVER
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 3  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF P/L INTRG NO. 2 POWER SUPPLY. ALSO, LOSS OF: THE P/L  
INTRG 2 SIGNAL TO KU-BAND SIGNAL PROCESSOR; 28VDC TO P/L STATION  
DISTRIBUTION PANEL; PARTIAL LOSS OF S-BAND P/L ANTENNA  
POLARIZATION CONTROL; AND, LOSS OF SWITCH CONTROL OF SEVERAL  
FUNCTIONS WITHIN P/L INTRG 2. FAILURE OF ALL REDUNDANCY WOULD  
CAUSE LOSS OF COMMAND/DATA FUNCTIONS OF PAYLOAD AND LIKELY RESULT  
IN LOSS OF MISSION.

REFERENCES: SSSH 16.14, SYST SCHEM VS70-740239

REPORT DATE 12/31/87

C-318

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/14/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3524 ABORT: 3/2R

ITEM: DRIVER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD INTERROGATOR
- 2) MNBFLC2 BUS
- 3) 10AFUSE
- 4) DRIVER
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF PNL SWITCH AND GCIL SELECTION OF RIGHT CIRCULAR  
POLARIZATION OF S-BAND P/L ANTENNA IN CONJUNCTION WITH INTRG 1  
USE. SELECTION OF LEFT CIRCULAR POLARIZATION REMAINS AVAILABLE.  
NO REDUNDANCY FOR THIS ITEM/FUNCTION (WITH INTRG 1), HOWEVER,  
BOTH LEFT/RIGHT POLARIZATION REMAIN AVAILABLE IN CONJUNCTION WITH  
INTRG 2. FIRST FAILURE WOULD HAVE NO EFFECT ON MISSION, CREW,  
VEHICLE. FAILURE OF SECOND DRIVER IN CIRCUIT SELECTING RHCP  
(WITH INTRG 2) RESULTS IN LOSS OF ALL CAPABILITY TO SELECT  
RHCP FOR S-BAND P/L ANTENNA AND MAY CAUSE LOSS OF MISSION.

REFERENCES: SSSH 16.14, SYST SCHEM VS70-740239

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/14/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3525 ABORT: 3/2R

ITEM: DRIVER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD INTERROGATOR
- 2) MNBFLC2 BUS
- 3) 10AFUSE
- 4) DRIVER
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF PNL SWITCH AND GCIL SELECTION OF LEFT CIRCULAR  
POLARIZATION OF S-BAND P/L ANTENNA IN CONJUNCTION WITH INTRG 1  
USE. SELECTION OF RIGHT CIRCULAR POLARIZATION REMAINS AVAILABLE.  
NO REDUNDANCY FOR THIS ITEM/FUNCTION (WITH INTRG 1), HOWEVER,  
BOTH LEFT/RIGHT POLARIZATION REMAIN AVAILABLE IN CONJUNCTION WITH  
INTRG 2. FIRST FAILURE WOULD HAVE NO EFFECT ON MISSION, CREW,  
VEHICLE. FAILURE OF SECOND DRIVER IN CIRCUIT SELECTING LHCP  
(WITH INTRG 2) RESULTS IN LOSS OF ALL CAPABILITY TO SELECT  
LHCP FOR S-BAND P/L ANTENNA AND MAY CAUSE LOSS OF MISSION.

REFERENCES: SSSH 16.14, SYST SCHEM VS70-740239

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/14/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3526 ABORT: 3/2R

ITEM: DRIVER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD INTERROGATOR
- 2) MNCFLC3 BUS
- 3) 10AFUSE
- 4) DRIVER
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 3  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF PNL SWITCH AND GCIL SELECTION OF RIGHT CIRCULAR  
POLARIZATION OF S-BAND P/L ANTENNA IN CONJUNCTION WITH INTRG 2  
USE. SELECTION OF LEFT CIRCULAR POLARIZATION REMAINS AVAILABLE.  
FAILURE OF THIS SECOND DRIVER RESULTS IN LOSS OF ALL CAPABILITY  
TO SELECT RHCP FOR S-BAND P/L ANTENNA AND MAY CAUSE LOSS OF  
MISSION.

REFERENCES: SSSH 16.14, SYST SCHEM VS70-740239

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/14/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 3527 ABORT: 3/2R

ITEM: DRIVER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) S-BAND PAYLOAD INTERROGATOR
- 2) MNCFLC3 BUS
- 3) 10AFUSE
- 4) DRIVER
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FWD LOAD CONT ASSY 3  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF PNL SWITCH AND GCIL SELECTION OF LEFT CIRCULAR  
POLARIZATION OF S-BAND P/L ANTENNA IN CONJUNCTION WITH INTRG 2  
USE. SELECTION OF RIGHT CIRCULAR POLARIZATION REMAINS AVAILABLE.  
FAILURE OF THIS SECOND DRIVER RESULTS IN LOSS OF ALL CAPABILITY  
TO SELECT LHCP FOR S-BAND P/L ANTENNA AND MAY CAUSE LOSS OF  
MISSION.

REFERENCES: SSSH 16.14, SYST SCHEM VS70-740239

REPORT DATE 12/31/87

C-322

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4001 ABORT: 3/3

ITEM: KU BD EA-1 (INTERFACE AND CONTROL UNIT)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) EA-1
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: BAY 3A  
PART NUMBER: EA-1 MC403-0025-1001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE LOSS OF INPUT

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDs AND DN VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS VO ONLY VIA UHF SYS.) LOSS OF SV UPDATES PRESENTS WORST CASE CONDITION. EA-1 PROVIDES KU SYS CONTROL FUNCTIONS. LOSS OF THIS UNIT RESULTS IN LOSS OF KU BD SYS AND POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

C-323

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 4002 ABORT: 3/3

ITEM: KU BD EA-2 (RADAR SIGNAL PROCESSOR)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) EA-2
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: BAY 3A  
PART NUMBER: EA-2 MC403-0025-2001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDS AND DN  
VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS  
OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND  
COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW.  
(UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS  
VO ONLY VIA UHF SYS.) EA-2 PROVIDES KU RADAR SIGNAL  
PROCESSING FUNCTION. LOSS OF THIS UNIT DOES NOT AFFECT THE KU BD  
COMM CAPABILITY.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4003 ABORT: 3/3

ITEM: KU BD SPA (SIGNAL PROCESSOR ASSY)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) SPA
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: BAY 3B  
PART NUMBER: KU SPA MC403-0025-4001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDs AND DN  
VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS  
OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND  
COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW.  
(UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS  
VO ONLY VIA UHF SYS.) LOSS OF SV UPDATES PRESENTS  
WORST CASE CONDITION. SPA PROCESSES DATA FOR KU BD TRANSMISSION  
TO GND AND PROCESSES UPLINK KU BD DATA FOR ON BOARD DISTRIBUTION.  
LOSS OF THIS UNIT WOULD CAUSE LOSS OF KU COMM CAPABILITY  
RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87 C-325

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/03/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4004 ABORT: 3/3

ITEM: NSP (NETWORK SIGNAL PROCESSOR)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) NSP
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: BAY 3A  
PART NUMBER: MC476-0137-0001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART FAILURE, TEMPERATURE, LOSS OF INPUT

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDS AND DN VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY VIA SECOND NSP, AND UNLIKE SYS REDUND VIA TWO S-BAND PM AND FM SYSTEMS PLUS VO ONLY VIA UHF SYS.) LOSS OF SV LOSS OF SV UPDAT'WORST CASE CONDITION. NSP PROCESSES KU BD CHANNEL 1 DN LK AND THE UPLINK VO AND CMD DATA. LOSS OF THIS UNIT WOULD CAUSE LOSS OF KU COMM SV UPDATE CAPABILITY RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87 C-326

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4005 ABORT: 3/3

ITEM: KU BD DEA (DEPLOYED ELECTRONIC ASSY)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) DEA
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PAYLOAD BAY  
PART NUMBER: KU DA MC403-0025-3001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDs AND DN VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS VO ONLY VIA UHF SYS.) LOSS OF SV UPDATES PRESENTS WORST CASE CONDITION. DEA PROVIDES RECEIVER/EXCITER ELECTRONICS FOR TRANSMISSION AND RECEPTION OF KU BD SIGNALS. FAILURE WOULD CAUSE LOSS OF KU COMM CAPABILITY RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/29/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4006 ABORT: 3/3

ITEM: KU BD DEA (DEPLOYED ELECTRONIC ASSY)  
FAILURE MODE: FAILS OUT OF TOLERANCE

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) DEA
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PAYLOAD BAY  
PART NUMBER: KU DA MC403-0025-3001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDs AND DN VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS VO ONLY VIA UHF SYS.) LOSS OF SV UPDATES PRESENTS WORST CASE CONDITION. DEA PROVIDES RCVR/EXCITER ELECTRONICS FOR TRANSMISSION AND RECEPTION OF KU BD SIGNALS. EXCEEDING TOLERANCE LIMITS FOR RF SENS, S/N RATIO AND RF OUT LEVEL COULD CAUSE LOSS OF KU COMM CAP RESULTING IN POSS LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4007 ABORT: 3/3

ITEM: KU BD DMA (DEPLOYED MECHANICAL ASSY)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) DMA
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PAYLOAD BAY  
PART NUMBER: KU DA MC403-0025-3001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDs AND DN VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS VO ONLY VIA UHF SYS.) LOSS OF SV UPDATES PRESENTS WORST CASE CONDITION. DMA PROVIDES ANTENNA AND GIMBAL MOTORS FOR POINTING ANT. FAILURE WOULD CAUSE LOSS ANTENNA POINTING AND TRACKING CAP THUS KU COMM CAP RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4008 ABORT: 3/3

ITEM: KU BD DMA (DEPLOYED MECHANICAL ASSY)  
FAILURE MODE: FAILS TO START/STOP

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) DMA
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PAYLOAD BAY  
PART NUMBER: KU DA MC403-0025-3001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDs AND DN VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS VO ONLY VIA UHF SYS.) LOSS OF SV UPDATES PRESENTS WORST CASE CONDITION. DMA PROVIDES ANTENNA AND GIMBAL MOTORS FOR POINTING ANT. FAILURE TO START/STOP WOULD PREVENT ANTENNA POINTING AND TRACKING THUS KU COMM CAP RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87 C-330

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4009 ABORT: 3/3

ITEM: KU BD DMA (DEPLOYED MECHANICAL ASSY)  
FAILURE MODE: ERRATIC OPERATION

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) DMA
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/1R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PAYLOAD BAY  
PART NUMBER: KU DA MC403-0025-3001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE, LOSS OF INPUT

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDS AND DN VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS VO ONLY VIA UHF SYS.) LOSS OF SV UPDATES PRESENTS WORST CASE CONDITION. DMA PROVIDES ANTENNA AND GIMBAL MOTORS FOR POINTING ANT. ERRATIC OPERATION WOULD CAUSE LOSS OF ANTENNA POINTING AND TRACKING CAP THUS KU COMM CAP RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87 C-331

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4010 ABORT: 3/3

ITEM: KU BD DMA (DEPLOYED MECHANICAL ASSY)  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) DMA
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PAYLOAD BAY  
PART NUMBER: KU DA MC403-0025-3001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDs AND DN VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS VO ONLY VIA UHF SYS.) LOSS OF SV UPDATES PRESENTS WORST CASE CONDITION. DMA PROVIDES ANTENNA AND GIMBAL MOTORS FOR POINTING ANT. BINDING/JAMMING WOULD PREVENT ANTENNA POINTING AND TRACKING THUS KU COMM CAP RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87 C-332

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4011 ABORT: 3/3

ITEM: KU BD COMM UP/FORWARD LINK MODE 1  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) KU BD COMM UP/FWD LINK
- 5) MODE 1
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: BAY 3A, BAY 3B, AND PAYLOAD  
PART NUMBER: EA-1 MC403-0025-1001, SPA MC403-0025-4001, DA  
MC403-0025-3001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE LOSS OF INPUT, LOSS OF INPUT

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UP AND DOWNLINK DATA (UP VO/CMDs AND DN  
VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS  
OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND  
COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW.  
(UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS  
VO ONLY VIA UHF SYS, AND UL VO AND CMDs VIA KU BD MODE 2.)  
LOSS OF SV PRESENTS WORST CASE CONDITION. MODE 1 UPLINK PROVIDES  
FOR VO, CMDs (SV), PL CMDs AND TEXT AND GRAPHICS. LOSS OF MODE 1  
AND SV UPDATES RESULT IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4012 ABORT: 3/3

ITEM: KU BD COMM UP/FORWARD LINK MODE 1  
FAILURE MODE: ERRATIC/INTERMITTENT OPERATION

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) KU BD COMM UP/FWD LINK
- 5) MODE 1
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: BAY 3A, BAY 3B, AND PAYLOAD  
PART NUMBER: EA-1 MC403-0025-1001, SPA MC403-0025-4001, DA  
MC403-0025-3001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE LOSS OF INPUT , LOSS OF INPUT

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDS AND DN  
VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS  
OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND  
COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW.  
(UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS  
VO ONLY VIA UHF SYS, AND UL VO AND CMDS VIA KU BD MODE 2.)  
LOSS OF SV PRESENTS WORST CASE CONDITION. MODE 1 UPLINK PROVIDES  
FOR VO, CMDS (SV), PL CMDS AND TEXT AND GRAPHICS.  
ERRATIC/INTERMITTENT OPS OF MODE 1 CAUSES LOSS OF SV UPDATES  
RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87 C-334

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4013 ABORT: 3/3

ITEM: KU BD COMM UP/FORWARD LINK MODE 1  
FAILURE MODE: FAILS OUT OF TOLERANCE

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) KU BD COMM UP/FWD LINK
- 5) MODE 1
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: BAY 3A, BAY 3B, AND PAYLOAD  
PART NUMBER: EA-1 MC403-0025-1001, SPA MC403-0025-4001, DA  
MC403-0025-3001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE LOSS OF INPUT

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDS AND DN  
VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS  
OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND  
COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW.  
(UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS  
VO ONLY VIA UHF SYS, AND UL VO AND CMDS VIA KU BD MODE 2.)  
LOSS OF SV PRESENTS WORST CASE CONDITION. MODE 1 UPLINK PROVIDES  
FOR VO, CMDS (SV), PL CMDS AND TEXT AND GRAPHICS. LOW RCVR SEN  
AND S/N RATIO COULD CAUSE LOSS OF SV UPDATES RESULTING IN  
POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

C-335

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4014 ABORT: 3/3

ITEM: KU BD COMM UP/FORWARD LINK MODE 2  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) KU BD COMM UP/FWD LINK
- 5) MODE 2
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: BAY 3A, BAY 3B, AND PAYLOAD  
PART NUMBER: EA-1 MC403-0025-1001, SPA MC403-0025-4001, DA  
MC403-0025-3001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE LOSS OF INPUT, LOSS OF INPUT

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDs AND DN  
VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS  
OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND  
COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW.  
(UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS  
VO ONLY VIA UHF SYS, AND UL VO AND CMDs VIA KU BD MODE 1.)  
LOSS OF SV PRESENTS WORST CASE CONDITION. MODE 2 UPLINK PROVIDES  
FOR VO AND CMDs (SV). LOSS OF MODE 2 AND SV UPDATES RESULT IN  
POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87 C-336



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4015 ABORT: 3/3

ITEM: KU BD COMM UP/FORWARD LINK MODE 2  
FAILURE MODE: ERRATIC/INTERMITTENT OPERATIONS

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) KU BD COMM UP/FWD LINK
- 5) MODE 2
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: BAY 3A, BAY 3B, AND PAYLOAD  
PART NUMBER: EA-1 MC403-0025-1001, SPA MC403-0025-4001, DA  
MC403-0025-3001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE LOSS OF INPUT, LOSS OF INPUT

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDS AND DN  
VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS  
OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND  
COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW.  
(UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS  
VO ONLY VIA UHF SYS, AND UL VO AND CMDs VIA KU BD MODE 1.)  
LOSS OF SV PRESENTS WORST CASE CONDITION. MODE 2 UPLINK PROVIDES  
FOR VO AND CMDs (SV). ERRATIC/INTERMITTENT OPERATIONS OF MODE 2  
CAUSES LOSS OF SV UPDATES RESULTING IN POSSIBLE LOSS OF VEHICLE  
AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4016 ABORT: 3/3

ITEM: KU BD COMM UP/FORWARD LINK MODE 2  
FAILURE MODE: FAILS OUT OF TOLERANCE

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) KU BD COMM UP/FWD LINK
- 5) MODE 2
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: BAY 3A, BAY 3B, AND PAYLOAD  
PART NUMBER: EA-1 MC403-0025-1001, SPA MC403-0025-4001, DA  
MC403-0025-3001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE LOSS OF INPUT

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDS AND DN  
VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS  
OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND  
COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW.  
(UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS  
VO ONLY VIA UHF SYS, AND UL VO AND CMDS VIA KU BD MODE 1.)  
LOSS OF SV PRESENTS WORST CASE CONDITION. MODE 2 UPLINK PROVIDES  
FOR VO AND CMDS (SV). LOW RF POWER OUTPUT OR FREQ SHIFT COULD  
RESULT IN LOSS OF SV UPDATES RESULTING IN POSSIBLE LOSS OF  
VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87 C-338

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4017 ABORT: 3/3

ITEM: KU BD COMM DOWN/RETURN LINK MODE 1  
FAILURE MODE: FAILS OUT OF TOLERANCE

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) KU BD COMM DN/RTN LINK
- 5) MODE 1
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: BAY 3A, BAY 3B, AND PAYLOAD  
PART NUMBER: EA-1 MC403-0025-1001, SPA MC403-0025-4001, DA  
MC403-0025-3001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE LOSS OF INPUT

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDs AND DN  
VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS  
OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND  
COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW.  
(UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS  
VO ONLY VIA UHF SYS, AND DL VO AND TLM VIA KU BD MODE 2.)  
LOSS OF SV PRESENTS WORST CASE CONDITION. MODE 1 DOWNLINK  
PROVIDES FOR VO, TLM (SV), PL, RCDR PB AND HI SPEED PL DATA. LOW  
RF PWR OUTPUT OR FREQ SHIFT COULD CAUSE LOSS OF MODE 2 (TLM) AND  
SV UPDATES RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4018 ABORT: 3/3

ITEM: KU BD COMM DOWN/RETURN LINK MODE 1 CHANNEL1  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) KU BD COMM DN/RTN LINK
- 5) MODE 1 CH 1 VOICE AND TELEMETRY (TLM)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: BAY 3A, BAY 3B, AND PAYLOAD  
PART NUMBER: EA-1 MC403-0025-1001, SPA MC403-0025-4001, DA  
MC403-0025-3001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE LOSS OF INPUT

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDS AND DN  
VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS  
OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND  
COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW.  
(UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS  
VO ONLY VIA UHF SYS, AND DL VO AND TLM VIA KU BD MODE 2.)  
LOSS OF SV PRESENTS WORST CASE CONDITION. MODE 1 CHANNEL 1  
DOWNLINK PROVIDES FOR VO AND TLM (SV). LOSS OF MODE 2 CH 1 (TLM)  
AND SV UPDATES RESULT IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

C-340

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 4019 ABORT: 3/3

ITEM: KU BD COMM DOWN/RETURN LINK MODE 1 CHANNEL 2  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) KU BD COMM DN/RTN LINK
- 5) MODE 1 CH 2 PL DATA OR RCDR PB DATA FOR PL/SSO
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: BAY 3A, BAY 3B, AND PAYLOAD  
PART NUMBER: EA-1 MC403-0025-1001, SPA MC403-0025-4001, DA  
MC403-0025-3001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE LOSS OF INPUT

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDs AND DN  
VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS  
OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND  
COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW.  
(UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS  
VO ONLY VIA UHF SYS, AND DL PL OR RCDR PB DATA VIA KU BD  
MODE 2.) MODE 1 CHANNEL 2 DOWNLINK PROVIDES FOR PL OR RCDR PB  
DATA. LOSS OF MODE 2 CH 2 RESULTS IN POSSIBLE LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 4020 ABORT: 3/3

ITEM: KU BD COMM DOWN/RETURN LINK MODE 1 CHANNEL 3  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) KU BD COMM DN/RTN LINK
- 5) MODE 1 CH 3 HIGH RATE (PL MAX) DATA
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	3/2R		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: BAY 3A, BAY 3B, AND PAYLOAD  
PART NUMBER: EA-1 MC403-0025-1001, SPA MC403-0025-4001, DA  
MC403-0025-3001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE LOSS OF INPUT

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDs AND DN  
VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS  
OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND  
COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW.  
(UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS  
VO ONLY VIA UHF SYS.) MODE 1 CHANNEL 3 DOWNLINK  
PROVIDES FOR HIGH RATE (PL MAX) DATA. LOSS OF MODE 1 CH 3  
RESULTS IN LOSS OF HIGH RATE DATA CAP AND POSSIBLE LOSS OF  
MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4021 ABORT: 3/3

ITEM: KU BD COMM DOWN/RETURN LINK MODE 2  
FAILURE MODE: FAILS OUT OF TOLERANCE

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) KU BD COMM DN/RTN LINK
- 5) MODE 2
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/1R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: BAY 3A, BAY 3B, AND PAYLOAD  
PART NUMBER: EA-1 MC403-0025-1001, SPA MC403-0025-4001, DA  
MC403-0025-3001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE LOSS OF INPUT

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDS AND DN  
VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS  
OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND  
COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW.  
(UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS  
VO ONLY VIA UHF SYS, AND DL VO AND TLM VIA KU BD MODE 1.)  
LOSS OF SV PRESENTS WORST CASE CONDITION. MODE 2 DOWNLINK  
PROVIDES FOR VO, TLM (SV), TV, PL AND RCDR PB DATA. LOW RF PWR  
OUTPUT OR FREQ DRIFT COULD CAUSE LOSS OF MODE 2 AND SV UPDATES  
RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4022 ABORT: 3/3

ITEM: KU BD COMM DOWN/RETURN LINK MODE 2 CHANNEL 1  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) KU BD COMM DN/RTN LINK
- 5) MODE 2 CH 1 VOICE AND TELEMETRY (TLM)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: BAY 3A, BAY 3B, AND PAYLOAD  
PART NUMBER: EA-1 MC403-0025-1001, SPA MC403-0025-4001, DA  
MC403-0025-3001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE LOSS OF INPUT

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDs AND DN  
VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS  
OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND  
COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW.  
(UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS  
VO ONLY VIA UHF SYS, AND DL VO AND TLM VIA KU BD MODE 1.)  
LOSS OF SV PRESENTS WORST CASE CONDITION. MODE 2 CH 1 DOWNLINK  
PROVIDES FOR VO AND TLM (SV). LOSS OF MODE 2 CH 1 AND SV UPDATES  
RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 4023 ABORT: 3/3

ITEM: KU BD COMM DOWN/RETURN LINK MODE 2 CHANNEL 2  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) KU BD COMM DN/RTN LINK
- 5) MODE 2 CH 2 PL DATA AND RCDR PB (SSO/PL) DATA
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: BAY 3A, BAY 3B, AND PAYLOAD  
PART NUMBER: EA-1 MC403-0025-1001, SPA MC403-0025-4001, DA  
MC403-0025-3001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE LOSS OF INPUT

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDs AND DN  
VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS  
OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND  
COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW.  
(UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS  
VO ONLY VIA UHF SYS, AND DL PL AND RCDR PB DATA VIA KU BD  
DL MODE 1.) MODE 2 CH 2 DOWNLINK PROVIDES FOR PL AND RCDR PB  
DATA. LOSS OF MODE 2 CH 2 RESULTS IN POSSIBLE LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 4024 ABORT: 3/3

ITEM: KU BD COMM DOWN/RETURN LINK MODE 2 CHANNEL 3  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) KU BD COMM DN/RTN LINK
- 5) MODE 2 CH 3 PL AND TV DATA
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: BAY 3A, BAY 3B, AND PAYLOAD  
PART NUMBER: EA-1 MC403-0025-1001, SPA MC403-0025-4001, DA  
MC403-0025-3001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART-  
FAILURE, TEMPERATURE LOSS OF INPUT

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDS AND DN VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS VO ONLY VIA UHF SYS, AND DL PL AND TV DATA VIA KU BD DL MODE 1.) MODE 2 CH 3 DOWNLINK PROVIDES FOR PL AND TV DATA. LOSS OF MODE 2 CH 3 RESULTS IN POSSIBLE LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4025 ABORT: 3/3

ITEM: KU A PWR SW (REF NAVAIDS RR)  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) COM SECTION
- 5) KU A MODE SWITCH S12
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: S12 ME452-0102-7306

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDs AND DN VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS VO ONLY VIA UHF SYS, SW FUNC VIA GCIL CMD.) LOSS OF SV UPDATES PRESENTS THE WORST CASE CONDITION. THE KU PWR SWITCH SELECTS ON/OFF/STBY FOR KU COMM/RADAR SYSTEM. FAILURE WOULD RESULT IN LOSS OF KU-BAND COMM CAPABILITY.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4026 ABORT: 3/3

ITEM: KU A PWR SW (REF NAVAIDS RR)  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) COM SECTION
- 5) KU A MODE SWITCH S12
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: S12 ME452-0102-7306

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDS AND DN VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS VO ONLY VIA UHF SYS, SW FUNC VIA GCIL CMD.) LOSS OF SV UPDATES PRESENTS WORST CASE CONDITION. THE KU PWR SWITCH SELECTS ON/OFF/STBY FOR KU COMM/RADAR SYS. OPEN/SHORT COULD IN WORST CASE PREVENT APPLICATION OF PWR TO KU-BD COMM AND COULD BLOW FUSE RESULTING IN LOSS OF KU BD CAP.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4027 ABORT: 3/3

ITEM: KU A MODE SW (REF NAVAIDS RR)  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) COM SECTION
- 5) KU A MODE SWITCH S13
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: S13 ME452-0102-7406

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDs AND DN VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS VO ONLY VIA UHF SYS, SW FUNC VIA GCIL CMD.) LOSS OF SV UPDATES PRESENTS THE WORST CASE CONDITION. THE KU MODE SWITCH SELECTS RDR COOP/RDR PASSIVE/COMM. FAILURE TO SELECT COMM WOULD RESULT IN LOSS OF KU-BAND COMM CAPABILITY.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4028 ABORT: 3/3

ITEM: KU A MODE SW (REF NAVAIDS RR)  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) COM SECTION
- 5) KU A MODE SWITCH S13
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: S13 ME452-0102-7406

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDs AND DN VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS VO ONLY VIA UHF SYS, SW FUNC VIA GCIL CMD.) LOSS OF SV UPDATES PRESENTS THE WORST CASE CONDITION. THE KU MODE SWITCH SELECTS RDR COOP/RDR PASSIVE/COMM. FAILURE TO SELECT COMM WOULD RESULT IN LOSS OF KU-BAND COMM CAPABILITY. AN OPEN/SHORT WOULD IN WORST CASE PREVENT SELECTION OF KU-BAND COMM.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/15/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 4029 ABORT: 3/3

ITEM: KU BD SIG PROC HDR SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) SIG PROC ASSY
- 5) HDR SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: S15

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDs AND DN VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS VO ONLY VIA UHF SYS, SW VIA UL GCIL CMD.) HDR SW SELECTS INPUT TO DL KU BD CHANNEL 3; TV/PL DIG/PL ANL/PI/PL MAX/OFF. FAILURE TO SW FROM OFF PRESENTS WORST CASE RESULTING IN LOSS OF DOWNLINK TV AND PL DATA RESULTING IN POSSIBLE LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/15/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 4030 ABORT: 3/3

ITEM: KU BD SIG PROC HDR SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) SIG PROC ASSY
- 5) HDR SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: S15

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDs AND DN VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS VO ONLY VIA UHF SYS, SW VIA UL GCIL CMD.) HDR SW SELECTS INPUT TO DL KU BD CHANNEL 3; TV/PL DIG/PL ANL/PI/PL MAX/OFF. OPEN/SHORT WOULD NEGATE SW FUNCTION RESULTING IN LOSS OF DOWNLINK TV AND PL DATA RESULTING IN POSSIBLE LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/15/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 4031 ABORT: 3/3

ITEM: KU BD SIG PROC LDR SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) SIG PROC ASSY
- 5) LDR SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: S16

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDs AND DN VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS VO ONLY VIA UHF SYS, SW VIA UL GCIL CMD.) LDR SW SELECTS INPUT TO DL KU BD CHANNEL 2; PI/PL DIG/OPS RCDR/PL RCDR/OFF. FAILURE TO SW FROM OFF WOULD PRESENT THE WORST CASE RESULTING IN LOSS OF DOWNLINK PL AND PL RCDR PB DATA AND POSSIBLE LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/15/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 4032 ABORT: 3/3

ITEM: KU BD SIG PROC LDR SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) SIG PROC ASSY
- 5) LDR SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: S16

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDS AND DN VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS VO ONLY VIA UHF SYS, SW VIA UL GCIL CMD.) LDR SW SELECTS INPUT TO DL KU BD CHANNEL 2; PI/PL DIG/OPS RCDR/PL RCDR/OFF. OPEN/SHORT WOULD NEGATE SW FUNCTION RESULTING IN LOSS OF DOWNLINK PL AND PL RCDR PB DATA RESULTING IN POSSIBLE LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/03/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4033 ABORT: 3/3

ITEM: NSP GCIL UPLINK DATA SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) NSP/GCIL
- 5) UPLINK DATA SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER: S20

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDS AND DN VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY VIA SECOND SW, AND UNLIKE SYS REDUND VIA TWO S-BAND PM AND FM SYS PLUS VO ONLY VIA UHF SYS, SW VIA GCIL CMD.) SW SELECTS EITHER S-BD OR KU-BD DATA SOURCE. FAILURE TO SW WOULD PREVENT KU BD DATA SELECTION AND LOSS OF SV UPDATE CAP RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/03/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4034 ABORT: 3/3

ITEM: NSP GCIL UPLINK DATA SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) NSP/GCIL
- 5) UPLINK DATA SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1A2  
PART NUMBER: S20

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDs AND DN VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY VIA SECOND SW, AND UNLIKE SYS REDUND VIA TWO S-BAND PM AND FM SYS PLUS VO ONLY VIA UHF SYS, SW VIA GCIL CMD.) SW SELECTS EITHER S-BD OR KU-BD DATA SOURCE. OPEN/SHORT WOULD PREVENT KU BD DATA SELECTION AND LOSS OF SV UPDATE CAP RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

C-356

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 4035 ABORT: 3/3

ITEM: KU BD A ANT STEERING SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) COM SECTION
- 5) KU BD A ANT STEERING SW
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	3/3		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: S7 ME452-0093-5025

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDs AND DN VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS VO ONLY VIA UHF SYS, SW FUNC VIA GND CMD.) KU BD STEERING SW SELECTS GPC/GPC DESIG/AUTO TK/MAN SLEW. FAILURE WOULD PREVENT SELECTING OPTIMUM ANT STEERING MODE. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109 AND VS70-590109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

C-357

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4036 ABORT: 3/3

ITEM: KU BD A ANT STEERING SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) COM SECTION
- 5) KU BD A ANT STEERING SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: S7 ME452-0093-5025

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDs AND DN VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS VO ONLY VIA UHF SYS, SW FUNC VIA GND CMD.) LOSS OF SV UPDATES PRESENTS THE WORST CASE CONDITION. THE KU BD FUNC SWITCH SELECTS GPC/GPC DESIG/AUTO TK/MAN SLEW. SHORT COULD CAUSE FUSE TO BLOW RESULTING IN LOSS OF KU BD CAP RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109 AND VS70-590109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87 C-358

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4037 ABORT: 3/3

ITEM: KU BD ANT DEPLOY/STOW SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) COM SECTION
- 5) KU BD ANT DEPLOY/STOW SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL R13  
PART NUMBER: S8 ME452-0102-7102

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDs AND DN VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS VO ONLY VIA UHF SYS, SW FUNC VIA DIRECT STOW SW AND PYRO SW.) FAILURE TO SELECT DEPLOY WOULD CAUSE LOSS OF KU BD CAP. FAILURE TO STOW COULD PREVENT CLOSURE OF PL BAY DOORS RESULTING IN POSS LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109 AND VS70-590109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4038 ABORT: 3/3

ITEM: KU BD ANT DEPLOY/STOW SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) COM SECTION
- 5) KU BD ANT DEPLOY/STOW SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL R13  
PART NUMBER: S8 ME452-0102-7102

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDS AND DN VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS VO ONLY VIA UHF SYS, SW FUNC VIA DIRECT STOW SW AND PYRO SW.) SHORTED SW COULD BLOW FUSE DISABLING DEPLOY/STOW CONTROL FUNCTION CAUSING LOSS OF DEPLOY LOSING KU COMM CAP AND STOW IF IN DEPLOYED POSITION PREVENTING CLOSURE OF PL BAY DOORS RESULTING IN POSS LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109 AND VS70-590109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87 C-360



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/15/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4039 ABORT: 3/3

ITEM: KU BD ANT DIRECT STOW SW  
FAILURE MODE: FAIL TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) ANT DIRECT STOW SW
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL R13  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE DIRECT STOW SW CAN BE USED TO STOW DA IN THE EVENT THAT THE DEPLOY/STOW SW DOES NOT PERFORM FUNC. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA PYRO SW.) FAILURE TO SW WOULD PREVENT DA STOW AND CLOSURE OF PL BAY DOORS RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109 AND VS70-590109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

C-361

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/15/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4040 ABORT: 3/3

ITEM: KU BD ANT DIRECT STOW SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) ANT DIRECT STOW SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL R13  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE DIRECT STOW SW CAN BE USED TO STOW DA IN THE EVENT THAT THE DEPLOY/STOW SW FAILS TO STOW DA. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA PYRO SW.) OPEN/SHORT WOULD NEGATE SW OPERATION PREVENTING DA STOW CAP PREVENTING CLOSURE OF PL BAY DOORS RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109 AND VS70-590109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

C-362

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 1/1  
MDAC ID: 4041 ABORT: 3/3

ITEM: KU BD ANT A PYRO ARM/SAFE SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) KU BD ANT A PYRO ARM/SAFE SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	1/1	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A14  
PART NUMBER: S19

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE PYRO SW HAS NO AFFECT ON KU COMM. PYRO ARM/SAFE SW PROVIDES POWER TO JETTISON/SAFE SW FOR INITIATION OF GUILLOTINE TO SEPARATE DEPLOYED ASSY IN CASE OF EMERGENCY. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE OR UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA EVA PROCEDURE.) TWO SECTION SW PROVIDING POWER FROM TWO SEPARATE PWR MAINS. FAILURE TO SW WOULD PREVENT JETTISON OF ANT ASSY AND PL BAY DOOR CLOSURE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109 AND VS70-590109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

C-363

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 1/1  
MDAC ID: 4042 ABORT: 3/3

ITEM: KU BD ANT A PYRO ARM/SAFE SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) KU BD ANT A PYRO ARM/SAFE SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	1/1	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A14  
PART NUMBER: S19

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE PYRO SW HAS NO AFFECT ON KU COMM. PYRO ARM/SAFE SW PROVIDES POWER TO JETTISON/SAFE SW FOR INITIATION OF GUILLOTINE TO SEPARATE DEPLOYED ASSY IN CASE OF EMERGENCY. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE OR UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA EVA PROCEDURE.) TWO SECTION SW PROVIDING POWER FROM TWO SEPARATE PWR MAINS. OPEN/SHORT OF ONE SECTION WOULD NOT BE CAUSE FOR LOSS OF VEHICLE AND CREW. IN WORST CASE OPEN/SHORT OF BOTH SECT WOULD PREVENT JETTISON OF ANT ASSY AND PL BAY DOOR CLOSURE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109 AND VS70-590109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

C-364

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 1/1  
MDAC ID: 4043 ABORT: 3/3

ITEM: KU BD ANT A PYRO JETT/SAFE SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) KU BD ANT A PYRO JETT/SAFE SW
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	1/1	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A14  
PART NUMBER: S20

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE PYRO SW HAS NO AFFECT ON KU COMM. PYRO JETT/SAFE SW PROVIDES POWER TO GUILLOTINE TO SEPARATE DEPLOYED ASSY IN CASE OF EMERGENCY. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE OR UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA EVA PROCEDURE.) TWO SECTION SW PROVIDING POWER FROM TWO SEPARATE PWR MAINS. FAILURE TO SW WOULD PREVENT JETTISON OF ANT ASSY AND PL BAY DOOR CLOSURE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109 AND VS70-740199, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

C-365

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 1/1  
MDAC ID: 4044 ABORT: 3/3

ITEM: KU BD ANT A PYRO JETT/SAFE SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) KU BD ANT A PYRO JETT/SAFE SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	1/1	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A14  
PART NUMBER: S20

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE PYRO SW HAS NO AFFECT ON KU COMM. PYRO JETT/SAFE SW PROVIDES POWER TO GUILLOTINE TO SEPARATE DEPLOYED ASSY IN CASE OF EMERGENCY. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE OR UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA EVA PROCEDURE.) TWO SECTION SW PROVIDING POWER FROM TWO SEPARATE PWR MAINS. OPEN/SHORT OF ONE SECTION WOULD NOT BE CAUSE FOR LOSS OF VEHICLE AND CREW. IN WORST CASE OPEN/SHORT OF BOTH SECT WOULD PREVENT JETTISON OF ANT ASSY AND PL BAY DOOR CLOSURE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109 AND VS70-590109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

C-366

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 4045 ABORT: 3/3

ITEM: KU BD CONTROL SW (CMD/PNL)  
FAILURE MODE: FAILS TO SW

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) COM SECTION
- 5) KU BD CONTROL SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: S6

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDs AND DN VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS VO ONLY VIA UHF SYS.) CONTROL SW SELECTS KU BD GCIL PANEL OR COMMAND CONTROL. FAILURE TO SW WOULD PREVENT CHANGE FROM SET POSITION CAUSING GCIL FUNC CONTROL VIA PNL ONLY OR CMD ONLY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

C-367

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 4046 ABORT: 3/3

ITEM: KU BD CONTROL SW (CMD/PNL)  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) COM SECTION
- 5) KU BD CONTROL SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A1  
PART NUMBER: S6

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UP AND DOWNLINK DATA; UP VO/CMDs AND DN VO/TLM/TV/RCDR PB DATA INCLUDING STATE VECTOR (SV) UPDATES. LOSS OF ALL MEANS FOR PROVIDING THIS CAP VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF VEHICLE AND CREW. (UNLIKE- REDUNDANCY EXISTS VIA TWO S-BAND PM AND FM SYSTEMS PLUS VO ONLY VIA UHF SYS.) CONTROL SW SELECTS KU BD GCIL PANEL OR COMMAND CONTROL. SHORT COULD CAUSE LOSS OF GCIL FUNC AND CONTROL OF KU BD SYS RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

C-368



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 4047 ABORT: 3/3

ITEM: TEXT AND GRAPHICS HARDCOPIER  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) TEXT AND GRAPHICS (TAG) HARDCOPIER
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: BAY 3B  
PART NUMBER: AV14453 (GFE)

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UPLINK VO/CMDs AND TAG DATA AND DOWNLINK  
VO/TLM/TV/RCDR PB DATA. LOSS OF ALL MEANS FOR PROVIDING TAG  
DATA VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN  
LOSS OF HARDCOPY TEXT, SCHEMATICS, MAPS AND PHOTOGRAPHS.  
(PARTIAL UNLIKE REDUNDANCY EXISTS VIA TELEPRINTER FOR HARDCOPY  
TEXT AND TWO S-BAND PM AND UHF SYS FOR UPLINK VOICE.)  
LOSS OF TAG HARDCOPY NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109 AND VS70-740199, SSSH  
16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF  
SECTION 18

REPORT DATE 12/31/87

C-369

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 4048 ABORT: 3/3

ITEM: TEXT AND GRAPHICS HARDCOPIER  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) TEXT AND GRAPHICS (TAG) HARDCOPIER
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: BAY 3B  
PART NUMBER: AV14453 (GFE)

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UPLINK VO/CMDs AND TAG DATA AND DOWNLINK  
VO/TLM/TV/RCDR PB DATA. LOSS OF ALL MEANS FOR PROVIDING TAG  
DATA VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN  
LOSS OF HARDCOPY TEXT, SCHEMATICS, MAPS AND PHOTOGRAPHS.  
(PARTIAL UNLIKE REDUNDANCY EXISTS VIA TELEPRINTER FOR HARDCOPY  
TEXT AND TWO S-BAND PM AND UHF SYS FOR UPLINK VOICE.)  
BINDING/JAMMING WOULD CAUSE LOSS OF TAG CAP. NO CAUSE FOR LOSS  
OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109 AND VS70-740199, SSSH  
16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF  
SECTION 18

REPORT DATE 12/31/87 C-370

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 4049 ABORT: 3/3

ITEM: TEXT AND GRAPHICS HARDCOPIER  
FAILURE MODE: ERRATIC/INTERMITTANT OPERATION

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) TEXT AND GRAPHICS (TAG) HARDCOPIER
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: BAY 3B  
PART NUMBER: AV14453 (GFE)

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UPLINK VO/CMDs AND TAG DATA AND DOWNLINK  
VO/TLM/TV/RCDR PB DATA. LOSS OF ALL MEANS FOR PROVIDING TAG  
DATA VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN  
LOSS OF HARDCOPY TEXT, SCHEMATICS, MAPS AND PHOTOGRAPHS.  
(PARTIAL UNLIKE REDUNDANCY EXISTS VIA TELEPRINTER FOR HARDCOPY  
TEXT AND TWO S-BAND PM AND UHF SYS FOR UPLINK VOICE.)  
ERRATIC/INTERMITTANT OPERATION WOULD RESULT IN LOSS OF TAG  
CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109 AND VS70-740199, SSSH  
16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF  
SECTION 18 AND 25

REPORT DATE 12/31/87

C-371

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 4050 ABORT: 3/3

ITEM: TEXT AND GRAPHICS MASTER PWR SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) TEXT AND GRAPHICS (TAG) MASTER PWR SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TAG HARDCOPIER  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UPLINK VO/CMDS AND TAG DATA AND DOWNLINK VO/TLM/TV/RCDR PB DATA. LOSS OF ALL MEANS FOR PROVIDING TAG DATA VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF HARDCOPY TEXT, SCHEMATICS, MAPS AND PHOTOGRAPHS. (PARTIAL UNLIKE REDUNDANCY EXISTS VIA TELEPRINTER FOR HARDCOPY TEXT AND TWO S-BAND PM AND UHF SYS FOR UPLINK UOICE, SW VIA GND CMD.) MOMENTARY MASTER PWR SW ENABLES TAG HARDCOPIER. FAILURE TO SW WOULD CAUSE LOSS OF TAG CAP. NO CAUSE FOR LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109 AND VS70-740199, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

C-372

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 4051 ABORT: 3/3

ITEM: TEXT AND GRAPHICS MASTER PWR SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) TEXT AND GRAPHICS (TAG) MASTER PWR SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TAG HARDCOPIER  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UPLINK VO/CMDS AND TAG DATA AND DOWNLINK VO/TLM/TV/RCDR PB DATA. LOSS OF ALL MEANS FOR PROVIDING TAG DATA VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF HARDCOPY TEXT, SCHEMATICS, MAPS AND PHOTOGRAPHS. (PARTIAL UNLIKE REDUNDANCY EXISTS VIA TELEPRINTER FOR HARDCOPY TEXT AND TWO S-BAND PM AND UHF SYS FOR UPLINK VOICE, SW VIA GND CMD.) MOMENTARY MASTER PWR SW ENABLES TAG HARDCOPIER. OPEN/SHORT COULD CAUSE LOSS OF TAG CAP. NO CAUSE FOR LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109 AND VS70-740199, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

C-373

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 4052 ABORT: 3/3

ITEM: TEXT AND GRAPHICS PAPER ADVANCE SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) TEXT AND GRAPHICS (TAG) PAPER ADVANCE SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TAG HARDCOPIER  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UPLINK VO/CMDs AND TAG DATA AND DOWNLINK  
VO/TLM/TV/RCDR PB DATA. LOSS OF ALL MEANS FOR PROVIDING TAG  
DATA VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN  
LOSS OF HARDCOPY TEXT, SCHEMATICS, MAPS AND PHOTOGRAPHS.  
(PARTIAL UNLIKE REDUNDANCY EXISTS VIA TELEPRINTER FOR HARDCOPY  
TEXT AND TWO S-BAND PM AND UHF SYS FOR UPLINK VOICE,  
SW VIA GND CMD.) MOMENTARY PAPER ADVANCE SW ALLOWS MANUAL  
CONTROL OF TAG HARDCOPIER PAPER MOVEMENT. FAILURE TO SW COULD  
CAUSE SOME INCONVENIENCE. NO CAUSE FOR LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109 AND VS70-740199, SSSH  
16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF  
SECTION 18

REPORT DATE 12/31/87

C-374

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 4053 ABORT: 3/3

ITEM: TEXT AND GRAPHICS PAPER ADVANCE SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) TEXT AND GRAPHICS (TAG) PAPER ADVANCE SW
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TAG HARDCOPIER  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UPLINK VO/CMDs AND TAG DATA AND DOWNLINK  
VO/TLM/TV/RCDR PB DATA. LOSS OF ALL MEANS FOR PROVIDING TAG  
DATA VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN  
LOSS OF HARDCOPY TEXT, SCHEMATICS, MAPS AND PHOTOGRAPHS.  
(PARTIAL UNLIKE REDUNDANCY EXISTS VIA TELEPRINTER FOR HARDCOPY  
TEXT AND TWO S-BAND PM AND UHF SYS FOR UPLINK VOICE,  
SW VIA GND CMD.) MOMENTARY PAPER ADVANCE SW ALLOWS MANUAL  
CONTROL OF TAG HARDCOPIER PAPER MOVEMENT. OPEN/SHORT COULD CAUSE  
SOME INCONVENIENCE. NO CAUSE FOR LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109 AND VS70-740199, SSSH  
16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF  
SECTION 18

REPORT DATE 12/31/87

C-375

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 4054 ABORT: 3/3

ITEM: TEXT AND GRAPHICS LAMP TEST SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) TEXT AND GRAPHICS (TAG) LAMP TEST SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TAG HARDCOPIER  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UPLINK VO/CMDs AND TAG DATA AND DOWNLINK  
VO/TLM/TV/RCDR PB DATA. LOSS OF ALL MEANS FOR PROVIDING TAG  
DATA VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN  
LOSS OF HARDCOPY TEXT, SCHEMATICS, MAPS AND PHOTOGRAPHS.  
(PARTIAL UNLIKE REDUNDANCY EXISTS VIA TELEPRINTER FOR HARDCOPY  
TEXT AND TWO S-BAND PM AND UHF SYS FOR UPLINK VOICE.)  
MOMENTARY LAMP TEST SW ALLOWS LIGHT AND INDICATOR CHECK OF TAG  
HARDCOPIER. FAILURE TO SW WOULD PREVENT CHECK AND COULD RESULT  
IN FALSE INDICATIONS. NO CAUSE FOR LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109 AND VS70-740199, SSSH  
16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF  
SECTION 18

REPORT DATE 12/31/87

C-376



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 4055 ABORT: 3/3

ITEM: TEXT AND GRAPHICS LAMP TEST SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) TEXT AND GRAPHICS (TAG) LAMP TEST SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TAG HARDCOPIER  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UPLINK VO/CMDs AND TAG DATA AND DOWNLINK  
VO/TLM/TV/RCDR PB DATA. LOSS OF ALL MEANS FOR PROVIDING TAG  
DATA VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN  
LOSS OF HARDCOPY TEXT, SCHEMATICS, MAPS AND PHOTOGRAPHS.  
(PARTIAL UNLIKE REDUNDANCY EXISTS VIA TELEPRINTER FOR HARDCOPY  
TEXT AND TWO S-BAND PM AND UHF SYS FOR UPLINK VOICE.)  
MOMENTARY LAMP TEST SW ALLOWS LIGHT AND INDICATOR CHECK OF TAG  
HARDCOPIER. OPEN/SHORT COULD PREVENT CHECK AND RESULT IN FALSE  
INDICATIONS. NO CAUSE FOR LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109 AND VS70-740199, SSSH  
16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF  
SECTION 18

REPORT DATE 12/31/87

C-377

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 4056 ABORT: 3/3

ITEM: TEXT AND GRAPHICS BRIGHTNESS CONTROL  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) TEXT AND GRAPHICS (TAG) BRIGHTNESS CONTROL
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TAG HARDCOPIER  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UPLINK VO/CMDs AND TAG DATA AND DOWNLINK  
VO/TLM/TV/RCDR PB DATA. LOSS OF ALL MEANS FOR PROVIDING TAG  
DATA VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN  
LOSS OF HARDCOPY TEXT, SCHEMATICS, MAPS AND PHOTOGRAPHS.  
(PARTIAL UNLIKE REDUNDANCY EXISTS VIA TELEPRINTER FOR HARDCOPY  
TEXT AND TWO S-BAND PM AND UHF SYS FOR UPLINK VOICE.)  
BRIGHTNESS CONTROL ALLOWS LIGHT LEVEL CONTROL OF TAG HARDCOPIER  
CRT. FAILURE TO SW COULD PREVENT OPTIMIZATION OF TAG HARDCOPIES.  
NO CAUSE FOR LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109 AND VS70-740199, SSSH  
16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF  
SECTION 18

REPORT DATE 12/31/87 C-378

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 4057 ABORT: 3/3

ITEM: TEXT AND GRAPHICS BRIGHTNESS CONTROL  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) TEXT AND GRAPHICS (TAG) BRIGHTNESS CONTROL
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	3/3		AQA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TAG HARDCOPIER  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UPLINK VO/CMDs AND TAG DATA AND DOWNLINK  
VO/TLM/TV/RCDR PB DATA. LOSS OF ALL MEANS FOR PROVIDING TAG  
DATA VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN  
LOSS OF HARDCOPY TEXT, SCHEMATICS, MAPS AND PHOTOGRAPHS.  
(PARTIAL UNLIKE REDUNDANCY EXISTS VIA TELEPRINTER FOR HARDCOPY  
TEXT AND TWO S-BAND PM AND UHF SYS FOR UPLINK VOICE.)  
BRIGHTNESS CONTROL ALLOWS LIGHT LEVEL CONTROL OF TAG HARDCOPIER  
CRT. OPEN/SHORT COULD PREVENT USE OF TAG. NO CAUSE FOR LOSS OF  
MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109 AND VS70-740199, SSSH  
16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF  
SECTION 18

REPORT DATE 12/31/87

C-379

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 4058 ABORT: 3/3

ITEM: TEXT AND GRAPHICS GAMMA CONTROL  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) TEXT AND GRAPHICS (TAG) GAMMA CONTROL
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TAG HARDCOPIER  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UPLINK VO/CMDS AND TAG DATA AND DOWNLINK  
VO/TLM/TV/RCDR PB DATA. LOSS OF ALL MEANS FOR PROVIDING TAG  
DATA VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN  
LOSS OF HARDCOPY TEXT, SCHEMATICS, MAPS AND PHOTOGRAPHS.  
(PARTIAL UNLIKE REDUNDANCY EXISTS VIA TELEPRINTER FOR HARDCOPY  
TEXT AND TWO S-BAND PM AND UHF SYS FOR UPLINK VOICE.)  
GAMMA CONTROL ALLOWS WHITE/DARK ENHANCEMENT OF TAG HARDCOPIER  
CRT. FAILURE TO SW WOULD PREVENT OPTIMIZATION OF TAG BLACK/WHITE  
CONTENT. NO CAUSE FOR LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109 AND VS70-740199, SSSH  
16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF  
SECTION 18

REPORT DATE 12/31/87 C-380

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 4059 ABORT: 3/3

ITEM: TEXT AND GRAPHICS GAMMA CONTROL  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) TEXT AND GRAPHICS (TAG) GAMMA CONTROL
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TAG HARDCOPIER  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UPLINK VO/CMDs AND TAG DATA AND DOWNLINK  
VO/TLM/TV/RCDR PB DATA. LOSS OF ALL MEANS FOR PROVIDING TAG  
DATA VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN  
LOSS OF HARDCOPY TEXT, SCHEMATICS, MAPS AND PHOTOGRAPHS.  
(PARTIAL UNLIKE REDUNDANCY EXISTS VIA TELEPRINTER FOR HARDCOPY  
TEXT AND TWO S-BAND PM AND UHF SYS FOR UPLINK VOICE.)  
GAMMA CONTROL ALLOWS WHITE/DARK ENHANCEMENT OF TAG HARDCOPIER  
CRT. OPEN/SHORT COULD PREVENT USE OF TAG. NO CAUSE FOR LOSS OF  
MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109 AND VS70-740199, SSSH  
16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF  
SECTION 18

REPORT DATE 12/31/87

C-381

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 4060 ABORT: 3/3

ITEM: TEXT AND GRAPHICS CONTRAST CONTROL  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) TEXT AND GRAPHICS (TAG) CONTRAST CONTROL
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TAG HARDCOPIER  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT PROVIDES ORB UPLINK VO/CMDs AND TAG DATA AND DOWNLINK VO/TLM/TV/RCDR PB DATA. LOSS OF ALL MEANS FOR PROVIDING TAG DATA VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN LOSS OF HARDCOPY TEXT, SCHEMATICS, MAPS AND PHOTOGRAPHS. (PARTIAL UNLIKE REDUNDANCY EXISTS VIA TELEPRINTER FOR HARDCOPY TEXT AND TWO S-BAND PM AND UHF SYS FOR UPLINK VOICE.) CONTRAST CONTROL ALLOWS WHITE/DARK BLENDING OF TAG HARDCOPIER CRT. FAILURE TO SW WOULD PREVENT OPTIMIZATION OF TAG HARDCOPY. NO CAUSE FOR LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109 AND VS70-740199, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

C-382

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 4061 ABORT: 3/3

ITEM: TEXT AND GRAPHICS CONTRAST CONTROL  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU COMM
- 3) KU-BAND COMM/RADAR
- 4) TEXT AND GRAPHICS (TAG) CONTRAST CONTROL
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TAG HARDCOPIER  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PIECE PART  
FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

COMM SECT OF KU-BD COMM/RDR SYS OPERATES IN SINGLE STRING CONFIG  
TO PROVIDE A TDRSS LINK BETWEEN THE GND AND ORB. THE COMM SECT  
PROVIDES ORB UPLINK VO/CMDs AND TAG DATA AND DOWNLINK  
VO/TLM/TV/RCDR PB DATA. LOSS OF ALL MEANS FOR PROVIDING TAG  
DATA VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE RESULT IN  
LOSS OF HARDCOPY TEXT, SCHEMATICS, MAPS AND PHOTOGRAPHS.  
(PARTIAL UNLIKE REDUNDANCY EXISTS VIA TELEPRINTER FOR HARDCOPY  
TEXT AND TWO S-BAND PM AND UHF SYS FOR UPLINK VOICE.)  
CONTRAST CONTROL ALLOWS WHITE/DARK BLENDING OF TAG HARDCOPIER  
CRT. OPEN/SHORT COULD PREVENT USE OF TAG. NO CAUSE FOR LOSS OF  
MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109 AND VS70-740199, SSSH  
16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF  
SECTION 18

REPORT DATE 12/31/87

C-383

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/26/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 4501 ABORT: 3/1R

ITEM: CIRCUIT BREAKER, 5A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND
- 2) MNC BUS
- 3) R15 PANEL
- 4) CIRCUIT BREAKER, 5A (KU SIG PROC) CB31
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/1R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/1R	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL R15  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28 VDC POWER SUPPLY FROM MNC TO THE HIGH DATA RATE AND  
LOW DATA RATE SELECTOR SWITCHES. LOSS OF 28 VDC POWER SUPPLY TO  
THE LOW VOLTAGE POWER SUPPLY WITHIN THE COMM SIGNAL PROCESSOR  
WHICH DISABLES K-BAND FORWARD/RETURN LINK DATA VIA TDRS.  
LOSS OF FORWARD LINK DATA CAUSES AUTO SWITCH TO S-BAND. FAILURE  
WOULD HAVE NO EFFECT ON MISSION/CREW/VEHICLE. LOSS OF ALL  
REDUNDANCY (S-BAND, KU-BAND, UHF) DISABLES STATE VECTOR UPDATE  
CAPABILITIES WHICH COULD RESULT IN LOSS OF CREW/VEHICLE.

REFERENCES: SSSH 16.5, SYSTEM SCHEMATIC VS70-740109 REV. E.

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/26/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 4502 ABORT: 3/3

ITEM: CIRCUIT BREAKER, 5A  
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND
- 2) MNC BUS
- 3) R15 PANEL
- 4) CIRCUIT BREAKER, 5A (KU SIG PROC) CB31
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL R15  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

COULD NOT DISCONNECT 28 VDC POWER SUPPLY TO THE LOW VOLTAGE POWER  
SUPPLY WITHIN THE COMM SIGNAL PROCESSOR (SPA). POWER TO THE SPA  
DATA RATE SELECTOR SWITCHES IS VIA THE KU-BAND POWER SWITCH WHICH  
PROVIDES ON/OFF/STBY CONTROL. CLOSED IS THE NORMAL  
ON-ORBIT CONFIGURATION. FAILURE WOULD HAVE NO EFFECT ON  
MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.5, SYSTEM SCHEMATIC VS70-740109 REV. E.

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/26/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 4503 ABORT: 3/1R

ITEM: CIRCUIT BREAKER, 15A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND
- 2) MNB BUS
- 3) R15 PANEL
- 4) CIRCUIT BREAKER, 15A (KU A ELEC) CB23
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL R15  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28 VDC TO POWER ON KU-BAND SYSTEM (COMM AND RADAR OPERATIONS). INABILITY OF RADAR ACQUISITION/TRACKING OF TDRS RESULTING IN ADDITIONAL LOSS OF S-BAND PM TRANSMISSION VIA TDRS. DIRECT A/G S-BAND PM & FM UNAFFECTED. INABILITY OF RADAR USAGE FOR PAYLOAD RENDEZVOUS. IF MISSION PRIME OBJECTIVE WAS P/L RETRIEVAL, FAILURE OF THIS ITEM COULD CAUSE LOSS OF MISSION. LOSS OF ALL REDUNDANCY (S-BAND, KU-BAND, UHF) DISABLES STATE VECTOR UPDATE CAPABILITIES WHICH COULD RESULT IN LOSS OF CREW/VEHICLE.

REFERENCES: SSSH 16.5, SYSTEM SCHEMATIC VS70-740109 REV. E.

REPORT DATE 12/31/87

C-386

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/26/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 4504 ABORT: 3/3

ITEM: CIRCUIT BREAKER, 15A  
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND
- 2) MNB BUS
- 3) R15 PANEL
- 4) CIRCUIT BREAKER, 15A (KU A ELEC) CB23
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES	
FLIGHT PHASE	HDW/FUNC	ABORT
PRELAUNCH:	3/3	RTLS: 3/3
LIFTOFF:	3/3	TAL: 3/3
ONORBIT:	3/3	AOA: 3/3
DEORBIT:	3/3	ATO: 3/3
LANDING/SAFING:	3/3	

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL R15  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

UNABLE TO REMOVE 28 VDC TO THE LOW VOLTAGE POWER SUPPLIES WITHIN THE RADAR/COMM INTERFACE AND CONTROL UNIT (EA-1) AND THE RADAR SIGNAL PROCESSOR (EA-2). UNABLE TO REMOVE 28 VDC TO THE DEPLOYED ELECTRONICS ASSEMBLY LOW VOLTAGE POWER SUPPLY AND KU-BAND TRANSMITTER. REMAINDER OF POWER CONTROLLED BY KU-BAND ON/OFF/STBY SWITCH. THIS CB NORMALLY CLOSED ON-ORBIT. FAILURE WOULD HAVE NO EFFECT ON MISSION/CREW/VEHICLE. IN THE CASE OF DA JETTISON, HOT CABLES WOULD BE SEVERED PROBABLY BLOWING ASSOCIATED FUSES.

REFERENCES: SSSH 16.5, SYSTEM SCHEMATIC VS70-740109 REV. E.

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/26/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 2/2  
MDAC ID: 4505 ABORT: 2/2

ITEM: CIRCUIT BREAKER, 7.5A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND
- 2) MNB BUS
- 3) R15 PANEL
- 4) CIRCUIT BREAKER, 7.5A (KU A ANT HTR) CB24
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	2/2
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL R15  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28 VDC CONTROLLING HEATER POWER TO ALPHA GIMBAL, BETA GIMBAL, RATE GYRO, AND FEED OF THE ANTENNA ASSEMBLY. DEPENDING ON TIME OF FAILURE, LOSS OF THESE TEMP MEASUREMENTS (PLUS XMTR & RCVR TEMPS) TO TLM OCCURS. ALSO, LOSS OF HEATERS WITHIN THE DEPLOYED ELECTRONICS ASSEMBLY. EXCESSIVE COLD TEMPS COULD DEGRADATE/INHIBIT ANTENNA OPERATIONS TO THE POINT OF LOSS OF MISSION.

REFERENCES: SSSH 16.5, SYST SCHEM VS70-740109

REPORT DATE 12/31/87

C-388

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/26/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 4506 ABORT: 3/3

ITEM: CIRCUIT BREAKER, 7.5A  
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND
- 2) MNB BUS
- 3) R15 PANEL
- 4) CIRCUIT BREAKER, 7.5A (KU A ANT HTR) CB24
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL R15  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

INABILITY TO REMOVE 28 VDC ON FOUR ANTENNA HEATERS  
(THERMOSTATICALLY - CONTROLLED) AND FOUR DEA HEATERS WITHIN THE  
DEPLOYED ELECTRONICS ASSEMBLY. THIS CB NORMALLY CLOSED ON-ORBIT.  
FAILURE WOULD HAVE NO EFFECT ON MISSION/CREW/VEHICLE. IN THE  
CASE OF DA JETTISON, HOT CABLES WOULD BE SEVERED PROBABLY BLOWING  
ASSOCIATED FUSES.

REFERENCES: SSSH 16.5, SYST SCHEM VS70-740109

REPORT DATE 12/31/87

C-389

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/26/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 4507 ABORT: 3/3

ITEM: CIRCUIT BREAKER, 3A  
FAILURE MODE: FAILS OPEN; CLOSED

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND
- 2) MNB BUS
- 3) R15 PANEL
- 4) CIRCUIT BREAKER, 3A (KU A CABLE HTR)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL R15  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:  
CIRCUIT BREAKER IS UNUSED.

REFERENCES: SSSH 16.5

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/28/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 2/2  
MDAC ID: 4508 ABORT: 2/2

ITEM: RPC, 10A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND
- 2) MNC BUS
- 3) RPC 53
- 4) EA-1 PWR SUPPLY
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	2/2
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD PWR CONT ASSY 3

PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28 VDC FROM MNC TO THE LOW VOLTAGE POWER SUPPLY WITHIN  
THE RADAR/COMM INTERFACE AND CONTROL UNIT (EA-1). CAUSES LOSS OF  
COMM DATA PROCESSOR AND ANTENNA CONTROL ELECTRONICS. LOSS OF  
RADAR CAPABILITY COULD CAUSE LOSS OF MISSION.

REFERENCES: SSSH 16.5, SYST SCHEM VS70-740109

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/28/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 4509 ABORT: 3/3

ITEM: RPC, 10A  
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND
- 2) MNC BUS
- 3) RPC 53
- 4) EA-1 PWR SUPPLY
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD PWR CONT ASSY 3  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:  
WOULD MAINTAIN MNC 28 VDC SUPPLY TO THE LOW VOLTAGE POWER SUPPLY  
WITHIN RADAR/COMM INTERFACE AND CONTROL UNIT (EA-1). FAILURE  
WOULD HAVE NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.5, SYST SCHEM VS70-740109

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/28/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 4510 ABORT: 3/2R

ITEM: FUSE, 3A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND
- 2) MNB BUS
- 3) CB 15A (KU A ELEC)
- 4) FUSE F1 (3A)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL R15  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF ONE OF TWO SOURCES PROVIDING POWER ON CAPABILITY OF THE KU-BAND SYSTEM. LOSS OF 28 VDC COMMANDING A STANDBY CONDITION OF KU-BAND SYSTEM. ALSO, LOSS OF SINGLE SOURCE 28 VDC TO THE LOW VOLTAGE POWER SUPPLY WITHIN THE RADAR/COMM INTERFACE AND CONTROL UNIT (EA-1). CAUSES LOSS OF COMM DATA PROCESSOR AND ANTENNA CONTROL ELECTRONICS. LOSS OF RADAR CAPABILITY COULD CAUSE LOSS OF MISSION. LOSS OF ALL REDUNDANCY (S-BAND, KU-BAND, UHF) DISABLES STATE VECTOR UPDATE CAPABILITIES WHICH COULD RESULT IN LOSS OF CREW/VEHICLE.

REFERENCES: SSSH 16.5, SYSTEM SCHEMATIC VS70-740109

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 4511 ABORT: 3/2R

ITEM: FUSE, 3A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND
- 2) MNB BUS
- 3) CB 15A (KU A ELEC)
- 4) FUSE F2 (3A)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANEL R15  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF ONE OF TWO 28 VDC SOURCES OF POWER ON. REDUNDANT FUSE  
(F1) FAILURE WOULD CAUSE LOSS OF POWER ON FUNCTION TO KU-BAND  
SYSTEM INCLUDING RADAR. LOSS OF RADAR CAPABILITY COULD CAUSE  
LOSS OF MISSION. LOSS OF ALL REDUNDANCY (S-BAND, KU-BAND, UHF)  
DISABLES STATE VECTOR UPDATE CAPABILITIES WHICH COULD RESULT IN  
LOSS OF CREW/VEHICLE.

REFERENCES: SSSH 16.5, SYSTEM SCHEMATIC VS70-740109

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 2/2  
MDAC ID: 4512 ABORT: 3/3

ITEM: FUSE, 3A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND
- 2) MNB BUS
- 3) CB 15A (KU A ELEC)
- 4) FUSE F5 (3A)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	2/2
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL R15  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28 VDC TO RELAY K1 WITHIN MPCA-2, RESULTS IN LOSS OF MNB  
28 VDC TO LOW VOLTAGE POWER SUPPLY AND KU-BAND TRANSMITTER WITHIN  
THE DEPLOYED ELECTRONICS ASSEMBLY. LOSS OF RADAR CAPABILITIES  
COULD RESULT IN LOSS OF MISSION.

REFERENCES: SSSH 16.5, SYST SCHEM VS70-740109

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/01/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 2/2  
MDAC ID: 4513 ABORT: 2/2

ITEM: FUSE, 3A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (ANTENNA PYRO)
- 2) CNTL AB1 BUS
- 3) FUSE F38 (3A)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	2/2
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28 VDC FROM CNTL AB1 VIA SAFE POSITION OF PYRO SWITCH 19  
TO CONTACTS OF K2 RELAY IN MPCA-2. RESULTS IN LOSS OF DEPLOYED  
ELECTRONICS ASSY TEMPS TO TLM. ALL HEATERS ARE THERMOSTATICALLY  
CONTROLLED BUT LOSS OF TLM WOULD MASK AN UNDER/OVER TEMP  
CONDITION. EXCESSIVE TEMP EXTREMES COULD DEGRADATE/INHIBIT  
TRANSMITTER OR RECEIVER AND ANTENNA OPS TO THE POINT OF LOSS OF  
MISSION.

REFERENCES: SSSH 16.5, SYST SCHEM VS70-740109

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/03/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 2/1R  
MDAC ID: 4514 ABORT: 3/3

ITEM: CIRCUIT BREAKER, 3A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU-BAND
- 3) PRYO JETT SYS A
- 4) MNA BUS
- 5) CIRCUIT BREAKER, 3A, CB26
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANEL ML86  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF ONE OF DUAL 28 VDC SUPPLIES TO PYRO KU ANT A/B ARM/SAFE SWITCH. DISABLES THE ASSOCIATED FORWARD LOAD CONTROL RESULTING IN LOSS OF KU-BAND ANTENNA JETTISON SYSTEM A/B. THESE TWO CBS ARE NORMALLY OPEN UNTIL JETTISON IS NECESSARY). FAILURE OF THE REDUNDANT ITEM IS NOT READILY DETECTABLE DURING FLIGHT. ANTENNA JETTISON (DUAL STRING) IS LAST RESORT FOLLOWING FAILURE OF BOTH NORMAL STOW OPS AND DIRECT STOW OPS. ANTENNA ASSY MUST BE STOWED OR JETTISONED TO CLOSE PAYLOAD BAY DOORS. FAILURE TO ACCOMPLISH RESULTS IN LOSS OF CREW/VEHICLE.

REFERENCES: SSSH 15.7

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/03/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 4515 ABORT: 3/3

ITEM: CIRCUIT BREAKER, 3A (PYRO JETT SYS A/B  
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) KU-BAND
- 3) PYRO JETT SYS A
- 4) MNA BUS
- 5) CIRCUIT BREAKER, 3A, CB26
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL ML86

PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

WOULD MAINTAIN 28 VDC POWER TO NORMALLY OPEN CONTACTS OF THE KU  
ANT ARM/SAFE SWITCH. FAILURE WOULD HAVE NO EFFECT ON  
MISSION/CREW/VEHICLE.

REFERENCES: SSSH 15.7

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/03/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 2/1R  
MDAC ID: 4516 ABORT: 2/1R

ITEM: CIRCUIT BREAKER, 3A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU BAND (ANTENNA PYRO)
- 2) MNC BUS
- 3) PANEL ML86
- 4) CIRCUIT BREAKER, 3A (PYRO JETT SYS B) CB30
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANEL ML86  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF ONE OF DUAL 28 VDC SUPPLIES TO PYRO KU ANT A ARM/SAFE SWITCH. DISABLES THE FORWARD LOAD CONTROL ASSY 2 RESULTING IN LOSS OF KU-BAND ANTENNA JETTISON SYSTEM B. SYSTEM A POWER IS SUPPLIED VIA CB 26. THESE TWO CBS ARE NORMALLY OPEN (UNTIL JETTISON IS NECESSARY). FAILURE OF THE REDUNDANT ITEM IS NOT READILY DETECTABLE DURING FLIGHT, THEREFORE, A CRITICAL ITEM. ANTENNA JETTISON (DUAL STRING) IS LAST RESORT FOLLOWING FAILURE OF BOTH NORMAL STOW OPS AND DIRECT STOW OPS. ANTENNA ASSY MUST BE STOWED/JETTISONED TO CLOSE P/L BAY DOORS. FAILURE TO ACCOMPLISH RESULTS IN LOSS OF CREW/VEHICLE.

REFERENCES: SSSH 15.7

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/03/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 4517 ABORT: 3/3

ITEM: CIRCUIT BREAKER, 3A  
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU BAND (ANTENNA PYRO)
- 2) MNC BUS
- 3) PANEL ML86
- 4) CIRCUIT BREAKER, 3A (PYRO JETT SYS B) CB30
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL ML86

PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

WOULD MAINTAIN 28 VDC FROM MNC TO NORMALLY OPEN CONTACTS OF THE  
KU ANT ARM/SAFE SWITCH. FAILURE WOULD HAVE NO EFFECT ON  
MISSION/CREW/VEHICLE.

REFERENCES: SSSH 15.7

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/03/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 4518 ABORT: 3/2R

ITEM: CIRCUIT BREAKER, 3A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU BAND (DEA)
- 2) AC3 MMC2 BUS
- 3) PANEL MA73
- 4) CIRCUIT BREAKER, 3A (MCA POWER AC3 3-PHASE MID2) CB12
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL MA73  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 3-PHASE PWR SUPPLY TO MOTOR 1 WHICH DRIVES ANTENNA ASSY FOR DEPLOY/STOW OPS. BACKED BY CB9 SUPPLYING 3-PHASE PWR TO MOTOR 2. EITHER STRING ALONE WILL PERFORM THE REQUIRED OPERATION. ADDITIONAL FAILURE (OF REDUNDANT CB9) CAUSES LOSS OF E-PHASE PWR TO MOTOR 2 RESULTING IN LOSS OF DEPLOYMENT, NORMAL STOW, AND DIRECT STOW OPS. EARLY LOSS OF ALL REDUNDANCY WOULD CAUSE LOSS OF ANTENNA ASSY DEPLOY CAPABILITY AND POSSIBLE LOSS OF MISSION. A LATER FAILURE OF ALL REDUNDANCY WOULD RESULT IN HAVING TO JETTISON THE DEPLOYED ASSY TO CLOSE PL BAY DOORS.

REFERENCES: SSSH 15.7

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/03/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 4519 ABORT: 3/3

ITEM: CIRCUIT BREAKER, 3A  
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (DEA)
- 2) AC3 MMC2 BUS
- 3) PANEL MA73
- 4) CIRCUIT BREAKER, 3A (MCA POWER AC3 3-PHASE MID2) CB12
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL MA73  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

WOULD MAINTAIN 3-PHASE POWER TO MMC 2 NORMALLY OPEN RELAY  
CONTACTS. POWER APPLICATION CONTROLLED BY PL BAY MECH POWER  
SYSTEM 1 ON/OFF SWITCH. FAILURE WOULD HAVE NO EFFECT ON  
MISSION/CREW/VEHICLE.

REFERENCES: SSSH 15.7

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/03/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 4520 ABORT: 3/2R

ITEM: CIRCUIT BREAKER, 3A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (DEA)
- 2) AC3 MMC4 BUS
- 3) PANEL MA73
- 4) CIRCUIT BREAKER, 3A (MCA POWER AC2 3-PHASE MID4) CB9
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PANEL MA73  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 3-PHASE PWR SUPPLY TO MOTOR 2 WHICH DRIVES ANTENNA ASSY FOR DEPLOY/STOW OPS. REDUNDANT WITH CB12 SUPPLYING 3-PHASE PWR TO MOTOR 1. EITHER STRING ALONE WILL PERFORM THE REQUIRED OPERATION. ADDITIONAL FAILURE (OF CB12) CAUSES LOSS OF 3-PHASE TO MOTOR 1 RESULTING IN LOSS OF DEPLOYMENT, NORMAL STOW, AND DIRECT STOW OPS. EARLY LOSS OF ALL REDUNDANCY WOULD CAUSE LOSS OF ANTENNA ASSY DEPLOY CAPABILITY AND POSSIBLE LOSS OF MISSION. A LATER FAILURE OF ALL REDUNDANCY WOULD RESULT IN HAVING TO JETTISON THE DEPLOYED ASSY TO CLOSE PL BAY DOORS.

REFERENCES: SSSH 15.7

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 4521 ABORT: 3/3

ITEM: CIRCUIT BREAKER, 3A  
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (DEA)
- 2) AC3 MMC4 BUS
- 3) PANEL MA73
- 4) CIRCUIT BREAKER, 3A (MCA POWER AC2 3-PHASE MID4) CB9
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL MA73

PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

WOULD MAINTAIN 3-PHASE POWER TO MMC 4 NORMALLY OPEN RELAY  
CONTACTS. POWER APPLICATION CONTROLLED BY PL BAY MECH PWR SYS 2  
ON/OFF SWITCH. FAILURE WOULD HAVE NO EFFECT ON  
MISSION/CREW/VEHICLE.

REFERENCES: SSSH 15.7

REPORT DATE 12/31/87

C-404

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 4522 ABORT: 3/2R

ITEM: RPC, 5A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (DEA)
- 2) MNC MPC3 BUS
- 3) RPC 5A
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: MID PWR CONT ASSY 3  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28 VDC FROM MNC TO THE MCA LOGIC CIRCUITS (DUAL STRING CIRCUITRY). WHEN ANTENNA ASSY IS FULLY DEPLOYED, LOSS OF THIS ITEM RESULTS IN LOSS OF SIGNAL (1 OF 2) THAT ENABLES THE K-BAND TRANSMITTER AND EA-1 ANTENNA SCANNING CIRCUITS. ALSO CAUSES LOSS OF TALK-BACK AND LOSS OF TLM (1 OF 2) SHOWING ANTENNA DEPLOYED POSITION, AND THE LOSS OF BOOM STOW ENABLE 2 EXCITATION SIGNAL (1 OF 2). FAILURE OF THIS ITEM PLUS THE REDUNDANT RPC WOULD DISABLE K-BAND TRANSMITTER (NO RADAR) AND WOULD REQUIRE THE ALTERNATE DIRECT STOW OPERATION. LOSS OF K-BAND XMTR COULD CAUSE LOSS OF MISSION.

REFERENCES: SSSH 15.7

REPORT DATE 12/31/87

C-405

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 4523 ABORT: 3/3

ITEM: RPC, 5A  
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (DEA)
- 2) MNC MPC3 BUS
- 3) RPC 5A
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID PWR CONT ASSY 3  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

WOULD MAINTAIN 28 VDC FROM MNC TO THE MCA LOGIC CIRCUITS. RPC IS  
CONTROLLED ON/OFF BY PANEL SWITCH. FAILURE WOULD NOT AFFECT  
CREW/VEHICLE/MISSION.

REFERENCES: SSSH 15.7

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 4524 ABORT: 3/2R

ITEM: RPC, 5A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (DEA)
- 2) MNB MPC2 BUS
- 3) RPC 5A
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: MID PWR CONT ASSY 2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28 VDC FROM MNB TO THE MCA LOGIC CIRCUITS (DUAL STRING CIRCUITRY). WHEN ANTENNA ASSY IS FULLY DEPLOYED, LOSS OF THIS ITEM RESULTS IN LOSS OF SIGNAL (1 OF 2) THAT ENABLES THE K-BAND TRANSMITTER AND EA-1 ANTENNA SCANNING CIRCUITS. ALSO CAUSES LOSS OF TALK-BACK AND LOSS OF TLM (1 OF 2) SHOWING ANTENNA DEPLOYED POSITION, & THE LOSS OF BOOM STOW ENABLE 2 EXCITATION SIGNAL (1 OF 2). AN ADDITIONAL FAILURE OF THIS REDUNDANT RPC WOULD DISABLE K-BAND TRANSMITTER (NO RADAR) AND WOULD REQUIRE THE ALTERNATE DIRECT STOW OPERATION. LOSS OF K-BAND XMTR COULD CAUSE LOSS OF MISSION.

REFERENCES: SSSH 15.7

REPORT DATE 12/31/87

C-407

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 4525 ABORT: 3/3

ITEM: RPC, 5A  
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (DEA)
- 2) MNB MPC2 BUS
- 3) RPC 5A
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID PWR CONT ASSY 2  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:  
WOULD MAINTAIN 28 VDC FROM MNB TO THE MCA LOGIC CIRCUITS. RPC IS  
CONTROLLED ON/OFF BY PANEL SWITCH. FAILURE WOULD NOT AFFECT  
CREW/VEHICLE/MISSION.

REFERENCES: SSSH 15.7



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 4526 ABORT: 3/2R

ITEM: FUSE, 1A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (DEA)
- 2) CNTLCA2 BUS
- 3) F23, 1A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION:  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28 VDC WHICH ENABLES GROUND CMD AND PANEL CMD OF ANTENNA  
ASSY DEPLOY BY MOTOR 1. LOSS OF 28 VDC WHICH ENABLES STOW  
(NORMAL) OPS BY MOTOR 1. REDUNDANT SIGNALS CONTROLLING MOTOR 1  
ARE SUPPLIED VIA REDUNDANT FUSE F20. ADDITIONAL REDUNDANCY  
PROVIDED BY FUSES F7 & F25 SUPPLYING POWER TO CONTROL MOTOR 2.  
EARLY LOSS OF ALL REDUNDANCY WOULD CAUSE LOSS OF ANTENNA ASSY  
DEPLOY CAPABILITY AND POSSIBLE LOSS OF MISSION. LOSS OF STOWAGE  
CAPABILITY WOULD BE OVERRIDDEN BY DIRECT STOW OPS.

REFERENCES: SSSH 15.7

REPORT DATE 12/31/87

C-409

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 4527 ABORT: 3/2R

ITEM: FUSE, 1A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (DEA)
- 2) CNTLCA1 BUS
- 3) F20, 1A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF REDUNDANCY TO FUSE F23. ALSO, LOSS OF 28 VDC SIGNAL  
ENABLING EA-1 TO POSITION THE ANTENNA INTO A STOW CONFIG. ALL  
SIGNALS/CMDs VIA FUSES F23 & F20 ARE DUPLICATED VIA FUSES F7 &  
F25 FOR ANTENNA DEPLOY/STOW BY MOTOR 2. EARLY LOSS OF ALL  
REDUNDANCY WOULD CAUSE LOSS OF ANTENNA ASSY DEPLOY CAPABILITY AND  
POSSIBLE LOSS OF MISSION. LOSS OF STOWAGE CAPABILITY WOULD BE  
OVERRIDDEN BY DIRECT STOW OPS.

REFERENCES: SSSH 15.7

REPORT DATE 12/31/87

C-410

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 4528 ABORT: 3/2R

ITEM: FUSE, 1A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (DEA)
- 2) CNTLBC1 BUS
- 3) F7, 1A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF REDUNDANCY TO FUSES F20 AND F25. ALSO, LOSS OF 28 VDC  
SIGNAL ENABLING EA-1 TO POSITION THE ANTENNA INTO A STOW CONFIG.  
ALL SIGNALS/CMDS VIA FUSES F7 & F25 ARE DUPLICATED VIA FUSES F20  
& F23 FOR ANTENNA DEPLOY/STOW BY MOTOR 1. EARLY LOSS OF  
ALL REDUNDANCY WOULD CAUSE LOSS OF ANTENNA ASSY DEPLOY CAPABILITY  
AND POSSIBLE LOSS OF MISSION. LOSS OF STOWAGE CAPABILITY WOULD  
BE OVERRIDDEN BY DIRECT STOW OPS.

REFERENCES: SSSH 15.7

REPORT DATE 12/31/87

C-411

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 4529 ABORT: 3/2R

ITEM: FUSE, 1A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (DEA)
- 2) CNTLBC2 BUS
- 3) F25, 1A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION:  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28 VDC WHICH ENABLES GROUND CMD AND PANEL CMD OF ANTENNA  
ASSY DEPLOY BY MOTOR 2. LOSS OF 28 VDC WHICH ENABLES STOW  
(NORMAL) OPS BY MOTOR 2. REDUNDANT SIGNALS CONTROLLING MOTOR 2  
ARE SUPPLIED VIA REDUNDANT FUSE F7. EARLY LOSS OF REDUNDANCY  
WOULD CAUSE LOSS OF ANTENNA ASSY DEPLOY CAPABILITY AND POSSIBLE  
LOSS OF MISSION. LOSS OF STOWAGE CAPABILITY WOULD BE OVERRIDDEN  
BY DIRECT STOW OPS.

REFERENCES: SSSH 15.7

REPORT DATE 12/31/87

C-412

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 4530 ABORT: 3/3

ITEM: FUSE, 1A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (DEA)
- 2) CNTLCA2 BUS
- 3) F24, 1A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28 VDC TO MMC2 TO INITIATE ANTENNA STOWAGE OPS (BACKUP)  
USING MOTOR 1. BOTH FUSES F24 AND F19 NEEDED TO ACTIVATE MOTOR  
1. LOSS OF MOTOR 1 ACTUATION OF DIRECT STOWAGE OF THE DEPLOYED  
ASSY. COMPLETE REDUNDANCY PROVIDED BY MOTOR 2 VIA FUSES F8 &  
F26. LOSS OF ALL REDUNDANCY WITHIN THIS BACKUP SYSTEM WOULD  
CAUSE INITIATION OF ANTENNA JETTISON OPS.

REFERENCES: SSSH 15.7

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 4531 ABORT: 3/3

ITEM: FUSE, 1A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (DEA)
- 2) CNTLCA1 BUS
- 3) F19, 1A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28 VDC TO MMC2 TO INITIATE ANTENNA STOWAGE OPS (BACKUP)  
USING MOTOR 1. BOTH FUSES F24 AND F19 NEEDED TO ACTIVATE MOTOR  
1. LOSS OF MOTOR 1 ACTUATION OF DIRECT STOWAGE OF THE DEPLOYED  
ASSY. COMPLETE REDUNDANCY PROVIDED BY MOTOR 2 VIA FUSES F8 &  
F26. LOSS OF ALL REDUNDANCY WITHIN THIS BACKUP SYSTEM WOULD  
CAUSE INITIATION OF ANTENNA JETTISON OPS.

REFERENCES: SSSH 15.7

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 4532 ABORT: 3/3

ITEM: FUSE, 1A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (DEA)
- 2) CNTLBC1 BUS
- 3) F8, 1A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28 VDC TO MMC4 TO INITIATE ANTENNA STOWAGE OPS (BACKUP)  
USING MOTOR 2. BOTH FUSES F8 AND F26 NEEDED TO ACTIVATE MOTOR 2.  
LOSS OF MOTOR 2 ACTUATION OF DIRECT STOWAGE OF THE DEPLOYED ASSY.  
LOSS OF ALL REDUNDANCY WITHIN THIS BACKUP SYSTEM WOULD  
CAUSE INITIATION OF ANTENNA JETTISON OPS.

REFERENCES: SSSH 15.7

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 4533 ABORT: 3/3

ITEM: FUSE, 1A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (DEA)
- 2) CNTLBC2 BUS
- 3) F26, 1A FUSE
- 4) S12, KU ANT DIRECT STOW ON/OFF SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28 VDC TO MMC4 TO INITIATE ANTENNA STOWAGE OPS (BACKUP)  
USING MOTOR 2. BOTH FUSES F26 AND F8 NEEDED TO ACTIVATE MOTOR 2.  
LOSS OF MOTOR 2 ACTUATION OF DIRECT STOWAGE OF THE DEPLOYED ASSY.  
COMPLETE REDUNDANCY PROVIDED BY MOTOR 1 VIA FUSES F24  
& F19. LOSS OF REDUNDANCY WITHIN THIS BACKUP SYSTEM WOULD CAUSE  
INITIATION OF ANTENNA JETTISON OPS.

REFERENCES: SSSH 15.7

REPORT DATE 12/31/87

C-416



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 4534 ABORT: 3/2R

ITEM: FUSE, 1A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (DEA)
- 2) CNTLAB1 BUS
- 3) F1, 1A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION:  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF ONE SOURCE OF 28 VDC TO MMC2 CONTROLLING APPLICATION OF 3-PHASE POWER TO MOTOR 1. THE REDUNDANT SIGNAL IS APPLIED VIA FUSE F16. FAILURE OF BOTH FUSES RESULTS IN LOSS OF MOTOR 1 ACTUATING DEPLOY/STOW OF ANTENNA ASSY. COMPLETE REDUNDANCY PROVIDED BY SYSTEM 2 ON/OFF SWITCH CONTROLLING MOTOR 2 VIA FUSES F28 & F6. HOWEVER, FAILURE OF EITHER OF THESE TWO FUSES DISABLES MOTOR 2. EARLY FAILURE OF ALL REDUNDANCY RESULTS IN LOSS OF ANTENNA DEPLOYMENT AND POSSIBLE LOSS OF MISSION. LOSS OF STOWAGE CAPABILITY WOULD BE OVERRIDDEN BY JETTISON OPS.

REFERENCES: SSSH 15.7

REPORT DATE 12/31/87

C-417

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 4535 ABORT: 3/2R

ITEM: FUSE, 1A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (DEA)
- 2) CNTLCA1 BUS
- 3) F16, 1A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/2R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/2R	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:  
LOSS OF REDUNDANCY TO FUSE F1. FAILURE OF BOTH FUSES DISABLES  
MOTOR 1 ACTUATION OF DEPLOY/STOW OF ANTENNA ASSY. COMPLETE  
REDUNDANCY PROVIDED BY SYSTEM 2 ON/OFF SWITCH CONTROLLING MOTOR 2  
VIA FUSES F28 & F6. HOWEVER, FAILURE OF EITHER OF THESE TWO  
FUSES DISABLES MOTOR 2. EARLY FAILURE OF ALL REDUNDANCY RESULTS  
IN LOSS OF ANTENNA DEPLOYMENT AND POSSIBLE LOSS OF MISSION. LOSS  
OF STOWAGE CAPABILITY WOULD BE OVERRIDDEN BY JETTISON OPS.

REFERENCES: SSSH 15.7

REPORT DATE 12/31/87

C-418

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 4536 ABORT: 3/2R

ITEM: FUSE, 1A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (DEA)
- 2) CNTLBA2 BUS
- 3) F33, 1A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION:  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF ONE SOURCE OF 28 VDC TO MMC2 CONTROLLING APPLICATION OF 3-PHASE POWER TO MOTOR 1. THE REDUNDANT SIGNAL IS APPLIED VIA FUSE F34. FAILURE OF BOTH FUSES RESULTS IN LOSS OF MOTOR 1 ACTUATING DEPLOY/STOW OF ANTENNA ASSY. COMPLETE REDUNDANCY PROVIDED BY SYSTEM 2 ON/OFF SWITCH CONTROLLING MOTOR 2 VIA FUSES F28 & F6. HOWEVER, FAILURE OF EITHER OF THESE TWO FUSES DISABLES MOTOR 2. EARLY FAILURE OF ALL REDUNDANCY RESULTS IN LOSS OF ANTENNA DEPLOYMENT AND POSSIBLE LOSS OF MISSION. LOSS OF STOWAGE CAPABILITY WOULD BE OVERRIDDEN BY JETTISON OPS.

REFERENCES: SSSH 15.7

REPORT DATE 12/31/87

C-419

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 4537 ABORT: 3/2R

ITEM: FUSE, 1A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (DEA)
- 2) CNTLCA2 BUS
- 3) F34, 1A FUSE
- 4) S1, PL BAY MECH PWR, SYS1 ON/OFF SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF REDUNDANCY TO FUSE F33. FAILURE OF BOTH FUSES DISABLES  
MOTOR 1 ACTUATION OF DEPLOY/STOW OF ANTENNA ASSY. COMPLETE  
REDUNDANCY PROVIDED BY SYSTEM 2 ON/OFF SWITCH CONTROLLING MOTOR 2  
VIA FUSES F28 & F6. HOWEVER, FAILURE OF EITHER OF THESE TWO  
FUSES DISABLES MOTOR 2. EARLY FAILURE OF ALL REDUNDANCY RESULTS  
IN LOSS OF ANTENNA DEPLOYMENT AND POSSIBLE LOSS OF MISSION. LOSS  
OF STOWAGE CAPABILITY WOULD BE OVERRIDDEN BY JETTISON OPS.

REFERENCES: SSSH 15.7

REPORT DATE 12/31/87

C-420

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 4538 ABORT: 3/3

ITEM: FUSE, 1A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (DEA)
- 2) CNTLAB2 BUS
- 3) F12, 1A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:  
LOSS OF ONE SOURCE OF 28 VDC TO TLM SIGNAL SHOWING ON/OFF STATUS  
OF MECH PWR SYSTEM 2. REDUNDANT SIGNAL IS APPLIED VIA FUSE F31.  
WOULD HAVE NO EFFECT ON CREW/VEHICLE/MISSION.

REFERENCES: SSSH 15.7

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 4539 ABORT: 3/3

ITEM: FUSE, 1A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (DEA)
- 2) CNTLCA2 BUS
- 3) F31, 1A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:  
LOSS OF REDUNDANCY TO FUSE F12. FAILURE OF BOTH FUSES CAUSES  
LOSS OF TLM SIGNAL. DOES NOT AFFECT CREW/VEHICLE/MISSION.

REFERENCES: SSSH 15.7

REPORT DATE 12/31/87

C-422

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 4540 ABORT: 3/2R

ITEM: FUSE, 1A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (DEA)
- 2) CNTLBC2 BUS
- 3) F28, 1A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION:  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28 VDC TO MMC4 CONTROLLING APPLICATION OF 3-PHASE PWR TO  
MOTOR 2. LOSS OF MOTOR 2 ACTUATING DEPLOY/STOW OF ANTENNA ASSY.  
EARLY FAILURE OF ALL REDUNDANCY RESULTS IN LOSS OF ANTENNA  
DEPLOYMENT AND POSSIBLE LOSS OF MISSION. LOSS OF STOWAGE  
CAPABILITY WOULD BE OVERRIDDEN BY JETTISON OPS. (BOTH FUSES F28  
& F6 ARE REQUIRED FOR APPLICATION OF 3-PHASE PWR TO MOTOR 2,  
WHICH IS REDUNDANT TO MOTOR 1).

REFERENCES: SSSH 15.7

REPORT DATE 12/31/87

C-423

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/14/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 4541 ABORT: 3/2R

ITEM: FUSE, 1A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (DEA)
- 2) CNTLBC1 BUS
- 3) F6, 1A FUSE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION:  
PART NUMBER:

CAUSES: CIRCUIT SHORT, CONTAMINATION, PIECE PART STRUCTURAL  
FAILURE, VIBRATION, MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28 VDC TO MMC4 CONTROLLING APPLICATION OF 3-PHASE PWR TO  
MOTOR 2. LOSS OF MOTOR 2 ACTUATING DEPLOY/STOW OF ANTENNA ASSY.  
EARLY FAILURE OF ALL REDUNDANCY RESULTS IN LOSS OF ANTENNA  
DEPLOYMENT AND POSSIBLE LOSS OF MISSION. LOSS OF STOWAGE  
CAPABILITY WOULD BE OVERRIDDEN BY JETTISON OPS. (BOTH FUSES F6 &  
F28 ARE REQUIRED FOR APPLICATION OF 3-PHASE PWR TO MOTOR 2, WHICH  
IS REDUNDANT TO MOTOR 1).

REFERENCES: SSSH 15.7

REPORT DATE 12/31/87

C-424



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/15/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/2R  
MDAC ID: 4542 ABORT: 3/2R

ITEM: RESISTOR, 1.2K  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (DEA)
- 2) CNTLCA3 BUS
- 3) 1.2K RESISTOR
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION:  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28 VDC TO MCA LOGIC CIRCUITS (DUAL STRING CIRCUITRY).  
WHEN ANTENNA ASSY IS FULLY DEPLOYED, LOSS OF THIS ITEM RESULTS IN  
LOSS OF ONE SIGNAL ENABLING K-BAND XMTR AND EA-1 ANTENNA SCANNING  
CIRCUITS. ALSO CAUSES LOSS OF ONE TLM SIGNAL AND TALK-BACK  
SHOWING ANTENNA DEPLOYED POSITION, AND THE LOSS OF ONE SIGNAL  
ENABLING BOOM STOW 2 EXCITATION. FAILURE OF THIS ITEM PLUS  
REDUNDANCY WOULD DISABLE K-BAND XMTR (NO RADAR) AND WOULD REQUIRE  
THE ALTERNATE DIRECT STOW OPERATION. LOSS OF K-BAND XMTR COULD  
CAUSE LOSS OF MISSION.

REFERENCES: SSSH 15.7

REPORT DATE 12/31/87

C-425

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/15/87  
SUBSYSTEM: COMM AND TRACK/EPD&C  
MDAC ID: 4543

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 3/2R

ITEM: RESISTOR, 1.2K  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: E.S. DALEY

SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (DEA)
- 2) CNTLBC3 BUS
- 3) 1.2K RESISTOR
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/2R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/2R	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

LOSS OF 28 VDC TO MCA LOGIC CIRCUITS (DUAL STRING CIRCUITRY).  
WHEN ANTENNA ASSY IS FULLY DEPLOYED, LOSS OF THIS ITEM RESULTS IN  
LOSS OF ONE SIGNAL ENABLING K-BAND XMTR AND EA-1 ANTENNA SCANNING  
CIRCUITS. ALSO CAUSES LOSS OF ONE TLM SIGNAL AND TALK-BACK  
SHOWING ANTENNA DEPLOYED POSITION, AND THE LOSS OF ONE SIGNAL  
ENABLING BOOM STOW 2 EXCITATION. FAILURE OF THIS ITEM PLUS  
PRIMARY CKT WOULD DISABLE K-BAND XMTR (NO RADAR) AND WOULD  
REQUIRE THE ALTERNATE DIRECT STOW OPERATION. LOSS OF K-BAND XMTR  
COULD CAUSE LOSS OF MISSION.

REFERENCES: SSSH 15.7

REPORT DATE 12/31/87

C-426

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/13/87  
SUBSYSTEM: COMM & TRACK  
MDAC ID: 5001

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 2/2  
ABORT: 3/1R

ITEM: UHF EVA/ATC EXTERNAL ANTENNA  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) UHF SYSTEM
- 3) UHF EXTERNAL ANTENNA
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: LOWER FORWARD FUSELAGE  
PART NUMBER: MC481-0066-0001

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
TEMPERATURE, THERMAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

THE ANTENNA IS USED BY THE SSO UHF EVA/ATC SYSTEM FOR TWO-WAY RF COMM WITH GROUND AND WITH EVA ASTRONAUTS. FAILURE DURING EVA OPS COULD CAUSE LOSS OF MAJOR MISSION OBJECTIVES DUE TO LOSS OF COMM BIOMED DATA. UNAVAILABILITY DURING DE-ORBIT/RETURN OR ABORTS COULD CAUSE LOSS OF CREW/VEHICLE BECAUSE UHF IS BACKUP FOR S-BAND PM VOICE COMM AND FOR STATE VECTOR UPDATES, PARTICULARLY FOR SUPPORT OF LANDING OPERATIONS. NOTE: THERE IS NO REDUNDANCY FOR THE ANTENNA ITSELF WITHIN THE UHF SYSTEM; HOWEVER, IS REDUNDANCY FOR THE FUNCTION OF THE UHF SYSTEM FOR AIR-TO-GROUND VOICE COMM.

REFERENCES: SCHEMATIC VS70-740119, SSSH 16.9, INCO/COMM SYS BRF 17, OMRSD V74 FILE III

REPORT DATE 12/31/87

C-427

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/3  
MDAC ID: 5002 ABORT: 3/3

ITEM: UHF AIRLOCK ANTENNA  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) UHF EVA/ATC SYSTEM
- 3) UHF AIRLOCK ANTENNA
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AIRLOCK  
PART NUMBER: V075-730513-001

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

THE AIRLOCK ANTENNA IS INTENDED TO BE USED FOR PRE-EVA RF LINK CHECKOUT OF THE EVC EQUIPMENT. LOSS OF ANTENNA OUTPUT WOULD NOT BE CRITICAL TO MISSION OR TO CREW/VEHICLE. EVC LINKS BETWEEN ASTRONAUTS CAN BE CHECKED OUT PRE-EVA FOR ALL THREE EVC OPERATIONAL MODES (MODE A, MODE B, AND BACKUP MODE), AND OPERABILITY OF SSO/EVC LINKS COULD BE INFERRED, AT LEAST FOR SIMPLEX COMM, FROM PRE-EVA VOICE CHECKS WITH GROUND.

REFERENCES: SCHEMATIC VS70-740119, SSSH 16.9, INCO/COMM SYS BRF 17, OMRSD V74 FILE III

REPORT DATE 12/31/87

C-428

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/23/87  
SUBSYSTEM: COMM & TRACK  
MDAC ID: 5003

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 2/2  
ABORT: 3/3

ITEM: UHF EVA/ATC TRANCEIVER  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) UHF EVA/ATC SYSTEM
- 3) UHF XCVR
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: RCA 8379452

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
TEMPERATURE

EFFECTS/RATIONALE:

THE XCVR PROVIDES SSO/ASTRONAUT COMM FOR EVA; ATC FOR LANDING OPS; BACKUP AIR-TO-GROUND VOICE FOR ALL MISSION PHASES. UHF RF LOSS FOR EVA OPS COULD CAUSE LOSS OF MAJOR MISSION OBJECTIVES (LOSS OF TWO-WAY VOICE COMM PLUS LOSS OF BIOMED DATA FROM EVA ASTRONAUTS), AND THUS COULD CAUSE LOSS OF MISSION. FAILURE COULD BE CAUSED BY RF PATH SPF'S (E.G., OPEN OR SHORT IN RF PATH, RF PIN DIODES, LO-PASS FILTER) OR CONTROL PATH SPF'S (E.G., PA ON/OFF LOGIC). NOTE: SEE MDAC ID 854 FOR A/G OPS.

REFERENCES: SCHEMATIC VS70-740119, SSSH 16.9, INCO/COMM SYS BRF 17, OMRSD V74 FILE III

REPORT DATE 12/31/87

C-429

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 5004 ABORT: 3/1R

ITEM: UHF EVA/ATC TRANSCEIVER  
FAILURE MODE: LOSS OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) UHF EVA/ATC SYSTEM
- 3) UHF XCVR
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	3/1R		AOA:	3/1R
DEORBIT:	3/1R		ATO:	3/1R
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: RCA 8379452

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

THE XCVR PROVIDES SSO/ASTRONAUT COMM FOR EVA; ATC FOR LANDING OPS; BACKUP A/G VCE COMM, ALL MISSION PHASES. UHF RF LOSS FOR A/G COMM COULD BE CAUSED BY RF PATH SPF'S (E.G., OPEN, SHORT IN RF PATH, RF PIN DIODES, PA, LO-PASS FILTER) OR CONTROL PATH SPF'S (E.G., PA ON/OFF LOGIC). UHF A/G VCE IS BACKUP FOR S-BAND PM AND KU-BAND TWO-WAY VCE FOR ONORBIT OPS AND FOR S-BAND PM AND KU-BAND TWO-WAY VCE FOR ORBIT OPS AND FOR S-BAND PM VCE FOR ALL PHASES, AND ALSO FOR STATE VECTOR UPDATES FOR ALL PHASES. LOSS OF ALL CAPABILITY FOR SV UPDATE COULD CAUSE LOSS OF CREW/VEHICLE. NOTE: SEE MDAC ID 853 FOR EVA OPS.

REFERENCES: SCHEMATIC VS70-740119, SSSH 16.9, INCO/COMM SYS BRF 17, OMRSD V74 FILE III

REPORT DATE 12/31/87

C-430

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/03/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 2/2  
MDAC ID: 5005 ABORT: 3/3

ITEM: UHF EVA/ATC TRANSCEIVER  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) UHF EVA/ATC SYSTEM
- 3) UHF XCVR
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	2/2		AOA:	/
DEORBIT:	/		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: RCA 8379452

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

THE XCVR PROVIDES SSO/ASTRONAUT COMM FOR EVA; ATC FOR LANDING OPS; BACKUP AIR-TO-GROUND VOICE FOR ALL MISSION PHASES. UHF RCV VOICE LOSS FOR EVA OPS COULD BE CAUSED BY SPF'S IN THE RCV AUDIO (E.G., HI-PASS FILTER, AUDIO AMP, AUDIO POWER AMP); XMIT VOICE LOSS BY SPF'S IN XMIT AUDIO OR KEY CONTROL (E.G., SHORT OR OPEN IN KEY CIRCUIT OR KEY AMP). UHF RCV BIOMED DATA LOSS FOR EVA COULD BE CAUSED BY SPF'S IN BIOMED SUBCARRIER MODULE OR IN BIOMED ENABLE CONTROL LINE TO SUBCARRIER MODULE. UHF AUDIO/BIOMED DATA LOSS FOR EVA OPS COULD CAUSE LOSS OF MAJOR MISSION OBJECTIVES AND THUS LOSS OF MISSION. SEE MDAC ID 856 FOR A/G OPS.

REFERENCES: SCHEMATIC VS70-740119, SSSH 16.9, INCO/COMM SYS BRF 17, OMRSD V74 FILE III

REPORT DATE 12/31/87

C-431

C-6

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/03/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 5006 ABORT: 3/1R

ITEM: UHF EVA/ATC TRANSCEIVER  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) UHF EVA/ATC SYSTEM
- 3) UHF XCVR
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: RCA 8379452

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FIALURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

THE XCVR PROVIDES SSO/ASTRONAUT COMM FOR EVA; ATC FOR LANDING OPS; BACKUP AIR-TO-GROUND VOICE FOR ALL MISSION PHASES. UHF RCV VOICE LOSS FOR A/G COMM COULD BE CAUSED BY SPF'S IN THE RCV AUDIO (E.G., HI-PASS FILTER, AUDIO AMP, AUDIO POWER AMP); XMIT AUDIO OR KEY CONTROL (E.G., SHORT OR OPEN IN KEY CIRCUIT OR KEY AMP). LOSS OF UHF TWO-WAY VOICE AS BACKUP FOR OPERATIONAL VOICE AND FOR STATE VECTOR UPDATE COULD CAUSE LOSS OF CREW/VEHICLE. SEE MDAC ID 855 FOR EVA OPS.

REFERENCES: SCHEMATIC VS70-740119, SSSH 16.9, INCO/COMM SYS BRF 17, OMRSD V74 FILE III

REPORT DATE 12/31/87

C-432



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/04/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 5007 ABORT: 3/1R

ITEM: UHF SIMPLEX PA PWR SWITCH  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, FAILS MID-TRAVEL,  
PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL), FAILS TO SWITCH

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) UHF EVA/ATC SYSTEM
- 3) PA POWER SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL 06  
PART NUMBER: ME452-0102-7201

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS SWITCH ENABLES A LOGIC GATE TO ALLOW MNA POWER TO BE APPLIED TO THE PA FOR SIMPLEX A/G AND ATC COMM. LOSS OF SWITCH FUNCTION COULD DISABLE THE PA. UHF IS USED IN HI-PWR MODE FOR A/G COMM FOR ALL MISSION PHASES AND FOR ATC LANDING OPS AS BACKUP FOR OPERATIONAL VOICE VIA S-BAND (ALL PHASES) AND KU-BAND (ORBIT PHASE), AND ALSO AS BACKUP FOR STATE VECTOR UPDATES. LOSS OF ALL CAPABILITY FOR STATE VECTOR UPDATES AND VOICE COMM FOR LANDING OPS SUPPORT COULD CAUSE LOSS OF CREW/VEHCILE.

REFERENCES: SCHEMATIC VS70-740119, SSSH 16.9, INCO/COMM SYS BR  
17, OMRSD V74 FILE III

REPORT DATE 12/31/87

C-433

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/3  
MDAC ID: 5008 ABORT: 3/3

ITEM: UHF SIMPLEX PWR SWITCH  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) UHF EVA/ATC SYSTEM
- 3) UHF XCVR PA
- 4) PA POWER SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL 06  
PART NUMBER: ME452-0102-7201

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS SWITCH ENABLES A LOGIC CIRCUIT BY GROUNDING A LOGIC GATE INPUT TO ALLOW POWER TO PIN DIODES THAT SWITCH THE PA INTO THE RF PATH. CONTROL BUS CA1 VOLTAGE SHORTED TO THE GROUNDED CONTACTS IN THE SWITCH WOULD CAUSE THE SYSTEM TO STAY IN THE PA BYPASS POSITION, KEEPING THE UHF SYSTEM IN THE LO-PWR MODE, POSSIBLY PREVENTING SOLID UHF COMM FOR SSO/GROUND UHF VOICE, BUT UL VOICE WOULD BE UNAFFECTED FOR UHF BACKUP TO S-BAND FOR STATE VECTOR UPDATE. NOTE: BUS CA1 IS PROTECTED BY A CURRENT-LIMITING RESISTOR - NO EFFECT ON BUS.

REFERENCES: SCHEMATIC VS70-740119, SSSH 16.9, INCO/COMM SYS BRF 17, OMRSD V74 FILE III

REPORT DATE 12/31/87

C-434

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 5009 ABORT: 3/1R

ITEM: UHF SIMPLEX POWER SWITCH  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, FAILS MID-TRAVEL,  
FAILS TO OPEN/CLOSE, PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL)

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) UHF EVA/ATC SYSTEM
- 3) UHF XCVR PA
- 4) PA POWER SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL 06  
PART NUMBER: ME452-0102-7201

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

IN THE "ON" POSITION THIS SWITCH GROUNDS A LOGIC GATE INPUT TO ENABLE POWER TO PIN DIODES TO SWITCH THE PA INTO THE RF PATH FOR UHF A/G DOWNLINK VOICE. IN THE "OFF" POSITION IT PERMITS PA BYPASS (UHF SYSTEM IN LOW POWER MODE) FOR UHF SIMPLEX OPS. A SWITCH FAILURE (OPEN, OR EQUIVALENT TO OPEN) WOULD DISABLE THE PA FOR ALL UHF MODES. UHF IS BACKUP FOR S-BAND PM VCE (ALL PHASES) INCLUDING STATE VECTOR UPDATE. LOSS OF ALL CAPABILITY FOR TWO-WAY VCE SUPPORT OF LANDING OPS COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SCHEMATIC VS70-740119, SSSH 16.9, INCO/COMM SYS BRP 17, OMRSD V74 FILE III

REPORT DATE 12/31/87

C-435

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 5010 ABORT: 3/1R

ITEM: UHF SIMPLEX POWER SWITCH  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) UHF EVA/ATC SYSTEM
- 3) UHF XCVR PA
- 4) PA POWER SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ F ] C [ P ]

LOCATION: PANEL 06  
PART NUMBER: ME452-0102-7201

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

IN THE "ON" POSITION THIS SWITCH ENABLES PWR TO PIN DIODES THAT SWITCH THE PA INTO THE RF PATH FOR UHF A/G DOWNLINK VCE. IN "OFF" POSITION IT PERMITS PA BYPASS (UHF SYSTEM IN LO-PWR MODE) FOR UHF SIMPLEX OPS. SWITCH NORMALLY IN "ON" THROUGHOUT MISSION. BRIDGING SHORT EQUIVALENT TO "ON" POSITION WOULD PREVENT PA BYPASS FOR SIMPLEX OPS IN CASE OF PA FAILURE, CAUSING LOSS OF UHF COMM EVEN FOR THE LIMITED CAPABILITY OF LO-PWR SIMPLEX FOR A/G VCE OPS. SUCH A SHORT WOULD NOT BE DETECTABLE IN FLIGHT. UHF IS BACKUP FOR S-BAND PM VCE (ALL PHASES). LOSS OF ALL CAPABILITY FOR TWO-WAY VCE SUPPORT OF LANDING OPS COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SCHEMATIC VS70-740119, SSSH 16.9, INCO/COMM SYS BRF 17, OMRSD V74 FILE III

REPORT DATE 12/31/87

C-436

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/3  
MDAC ID: 5011 ABORT: 3/3

ITEM: UHF SIMPLEX POWER SWITCH  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, FAILS MID-TRAVEL,  
FAILS TO OPEN/CLOSE, PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL),  
SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) UHF EVA/ATC SYSTEM
- 3) UHF XCVR PA
- 4) PA POWER SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL 06  
PART NUMBER: ME452-0102-7201

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS SWITCH ENABLES USE OF 10 WATT PA FOR SSO UHF XMIT (ON) OR CAUSES IT TO BE BYPASSED (OFF) FOR UHF SIMPLEX OPS. SWITCH IS NORMALLY IN "ON" THROUGHOUT MISSION. ONE SET OF CONTACTS ENABLES TLM INDICATION THAT PA IS OFF WHEN SWITCH IS IN "OFF" POSITION. OPEN OR FAULT EQUIVALENT TO OPEN IN THOSE CONTACTS WOULD KILL TLM MEASUREMENT V14S2016E (PA OFF). BRIDGING SHORT OF THOSE CONTACTS FOR "ON" POSITION WOULD GIVE FALSE INDICATION THAT PA IS OFF. NEITHER FAILED CONDITION WOULD POSE A THREAT TO MISSION OR CREW/VEHICLE.

REFERENCES: SCHEMATIC VS70-740119, SSSH 16.9, INCO/COMM SYS BRF 17, OMRSD V74 FILE III

REPORT DATE 12/31/87

C-437

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 5012 ABORT: 3/1R

ITEM: UHF XMIT FREQUENCY SELECT SWITCH  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, FAILS MID-TRAVEL,  
FAILS TO OPEN/CLOSE, PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL),  
FAILS TO SWITCH

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) UHF EVA/ATC SYSTEM
- 3) UHF XCVR PA
- 4) PA POWER SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL 06  
PART NUMBER: ME452-0102-7201

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS SWITCH SELECTS EITHER 296.8 MHZ OR 259.7 MHZ AS SSO UHF A/G XMIT FREQ. WITH OPEN IN SWITCH FOR PRIME FREQ POSITION (259.7) FOR ORBIT OPS, THE ALTERNATE WOULD BE SELECTED. JAM OR MID-TRAVEL FAILURE COULD CAUSE LOSS OF XMIT CAPABILITY FOR UHF 2-WAY VCE OPS. EMERGENCY ALTERNATIVE WOULD BE TO SELECT "G T/R" ON UHF MODE ROTARY SELECTOR ("G" IS "GUARD", THE INTERNATIONAL 243 MHZ DISTRESS FREQUENCY). UHF IS BACKUP FOR S-BAND PM (ALL PHASES) AND FOR KU-BAND (ON ORBIT). LOSS OF ALL CAPABILITY FOR STATE VECTOR UPDATE COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SCHEMATIC VS70-740119, SSSH 16.9, INCO/COMM SYS BRF 17, OMRSD V74 FILE III

REPORT DATE 12/31/87

C-438

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 2/2  
MDAC ID: 5013 ABORT: 3/3

ITEM: UHF XMIT FREQUENCY SELECT SWITCH  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, FAILS MID-TRAVEL,  
FAILS TO OPEN/CLOSE, PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL)

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) UHF EVA/ATC SYSTEM
- 3) UHF XCVR PA
- 4) PA POWER SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL 06  
PART NUMBER: ME452-0102-7201

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS SWITCH SELECTS EITHER 296.8 OR 259.7 MHZ AS SSO UHF A/G XMIT  
FREQ, WITH 296.8 BEING PRIME FOR NORMAL FULL DUPLEX COMM FOR EVA  
OPS. WITH OPEN IN SWITCH FOR PRIME FREQ POSITION 259.7 WOULD BE  
SELECTED. JAM OR MID-TRAVEL FAILURE COULD CAUSE LOSS OF  
XMIT CAPABILITY FOR UHF 2-WAY EVA VCE OPS. LOSS OF EVA COMM  
COULD CAUSE EVA TERMINATION AND LOSS OF MISSION FOR SOME FLIGHTS.

REFERENCES: SCHEMATIC VS70-740119, SSSH 16.9, INCO/COMM SYS BRF  
17, OMRSD V74 FILE III

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/10/87  
SUBSYSTEM: COMM & TRACK  
MDAC ID: 5014

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: UHF XMIT FREQUENCY SELECT SWITCH  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) UHF EVA/ATC SYSTEM
- 3) UHF XCVR
- 4) XMIT FREQUENCY SELECT SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL 06  
PART NUMBER: ME452-0102-7201

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THIS SWITCH SELECTS EITHER 259.7 OR 296.8 MHZ AS SSO UHF A/G XMIT FREQ. WITH SHORT IN SWITCH FOR PRIME FREQUENCY POSITION (259.7) FOR ORBIT OPS, THE ALTERNATE FREQUENCY WOULD BE SELECTED. FOR SHORT IN BOTH DECKS BOTH XCVR'S WOULD TRANSMIT SIMULTANEOUSLY. THE FAULT WOULD NOT PREVENT RECEIPT OF UHF UPLINK (A/G RCV), AND TWO-WAY UHF A/G VOICE COMM WOULD BE AVAILABLE. SHORT COULD ALSO KILL TELEMETRY MEASUREMENT V74S2040E, "UHF XMIT FREQ 296.8 SELECT." LOSS OF MEASUREMENT WOULD NOT AFFECT MISSION OR CREW/VEHICLE.

REFERENCES: SCHEMATIC VS70-740119, SSSH 16.9, INCO/COMM SYS BRP 17, OMRSD V74 FILE III

REPORT DATE 12/31/87

C-440



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/28/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 5501 ABORT: 3/1R

ITEM: CIRCUIT BREAKER, UHF, MNA  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, PHYSICAL  
BINDING/JAMMING, OPEN (ELECTRICAL)

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) UHF EVA/ATC SYSTEM
- 3) UHF XCVR
- 4) CB13, MNA PWR
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	3/1R		AOA:	3/1R
DEORBIT:	3/1R		ATO:	3/1R
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL R15  
PART NUMBER: MC454-0026, -2075

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

CB13 PROVIDES MNA PWR TO THE XCVR. ALTHOUGH THE COUNTERPART CB18 ALSO PROVIDES MNC PWR TO THE XCVR, ONLY MNA PWR IS PROVIDED TO THE 10-WATT PWR AMP REQUIRED FOR TWO-WAY VCE COMM WITH GROUND. UHF A/G VCE IS BACKUP FOR S-BAND PM VCE FOR ALL PHASES, AND ALSO FOR STATE VECTOR UPDATE FOR ALL PHASES. LOSS OF ALL CAPABILITY FOR SV UPDATE COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SCHEMATIC VS70-740119, SSSH 16.9, INCO/COMM SYS BR 17, OMRSD V74 FILE III

REPORT DATE 12/31/87

C-441

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/29/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/2R  
MDAC ID: 5502 ABORT: 3/3

ITEM: CIRCUIT BREAKER, UHF, MNC  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, PHYSICAL  
BINDING/JAMMING, OPEN (ELECTRICAL)

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) UHF EVA/ATC SYSTEM
- 3) CB18, MNC PWR
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	3/2R		AOA:	/
DEORBIT:	/		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 1 ] B [ F ] C [ P ]

LOCATION: PANEL R15  
PART NUMBER: MC454-0026, -2075

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

CB18 PROVIDES MNC POWER TO THE UHF XCVR (BUT NOT TO THE 10-WATT PA REQUIRED FOR VOICE COMM WITH GROUND). THE COUNTERPART CB13 PROVIDES MNA POWER TO THE XCVR (AND TO THE PA). THE XCVR IS USED IN LO-PWR MODE (NO PA) FOR TWO-WAY SSO/EVA ASTRONAUT VCE COMM (AND FOR RECEPTION OF BIOMED DATA DURING NORMAL EVA OPS). LOSS OF CB18 (FAILS OPEN) COULD NOT BE DETECTED (NO BITE, NO TLM). LOSS OF BOTH PATHS (CB18, CB13) FOR XCVR POWER (MNC, MNA) COULD CAUSE LOSS OF MAJOR MISSION OBJECTIVES FOR FLIGHT REQUIRING EVA OPS. NOTE: SEE MDAC ID 8503 FOR A/G OPS.

REFERENCES: SCHEMATIC VS70-740119, SSSH 16.9, INCO/COMM SYS BRP 17, OMRSD V74 FILE III

REPORT DATE 12/31/87

C-442

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM & TRACK FLIGHT: 3/1R  
MDAC ID: 5503 ABORT: 3/1R

ITEM: CIRCUIT BREAKER, UHF, MNC  
FAILURE MODE: FAILS TO REMAIN OPEN/CLOSED, PHYSICAL  
BINDING/JAMMING, OPEN (ELECTRICAL)

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) UHF EVA/ATC SYSTEM
- 3) CB18, MNC PWR
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ F ] C [ P ]

LOCATION: PANEL R15  
PART NUMBER: MC454-0026, -2075

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

CB18 PROVIDES MNC POWER TO THE UHF XCVR (BUT NOT TO THE 10-WATT PA REQUIRED FOR VOICE COMM WITH GROUND). THE COUNTERPART CB13 PROVIDES MNA POWER TO THE XCVR (AND TO THE PA). THE XCVR IS USED IN LO-PWR MODE (NO PA) FOR TWO-WAY SSO/EVA ASTRONAUT VCE COMM (AND FOR RECEPTION OF BIOMED DATA DURING NORMAL EVA OPS). LOSS OF CB18 (FAILS OPEN) COULD NOT BE DETECTED (NO BITE, NO TLM). LOSS OF BOTH PATHS (CB18, CB13) WOULD CAUSE LOSS OF UHF AS BACKUP FOR VOICE COMM AND FOR STATE VECTOR UPDATE. LOSS OF ALL CAPABILITY FOR A/G VCE COMM AND SV UPDATE COULD CAUSE LOSS OF CREW/VEHICLE. NOTE: SEE MDAC ID 8502 FOR EVA OPS.

REFERENCES: SCHEMATIC VS70-740119, SSSH 16.9, INCO/COMM SYS BRP 17, OMRSD V74 FILE III

REPORT DATE 12/31/87

C-443

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/05/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7001 ABORT: 3/1R

ITEM: TACAN  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) TACAN
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: '1 UNIT BAY 1, 1 UNIT BAY 2, 1 UNIT BAY 3A  
PART NUMBER: MC409-0014-0006

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

THE TRIPLE REDUNDANT TACAN UNITS, IN THREE SINGLE STRINGS, OPERATE SIMULTANEOUSLY TO PROVIDE SLANT RANGE AND BEARING INFORMATION DURING DEORBIT FROM 160,000 FEET ALT DOWN TO 1500 FEET ALT OR 15 NM FROM LANDING. LOSS OF ALL CAPABILITY FOR DETERMINING RANGE PLUS BEARING OR RANGE ONLY VIA LIKE AND UNLIKE REDUNDANCY COULD CAUSE LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY, TWO OTHER TACAN UNITS, AND UNLIKE-REDUNDANCY FOR DETERMINING RANGE AND BEARING EXISTS VIA THE GN&C SUBSYSTEM AND STARTING 15 NM FROM LANDING VIA THE MSBLS.) LOSS OF A TACAN COULD CAUSE LOSS OF RANGE PLUS BEARING CAPABILITY FOR THAT UNIT. LOSS OF A TRANSMITTER WOULD CAUSE LOSS OF RANGE ONLY.

REFERENCES: SYSTEM SCHEMATIC VS 70-740179, SSSH 9.2, OMRS NSTS 08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 1

REPORT DATE 12/31/87 C-444

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/05/87  
SUBSYSTEM: COMM AND TRACK  
MDAC ID: 7002

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: TACAN  
FAILURE MODE: INTERMITTENT AND ERRATIC OPERATION

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) TACAN
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: '1 UNIT BAY 1, 1 UNIT BAY 2, 1 UNIT BAY 3A  
PART NUMBER: MC409-0014-0006

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

TRIPLE REDUNDANT TACAN UNITS, IN THREE SINGLE STRINGS, OPERATE SIMULTANEOUSLY TO PROVIDE SLANT RANGE AND BEARING INFORMATION DURING DEORBIT FROM 160,000 FEET ALT DOWN TO 1500 FEET ALT OR 15 NM FROM LANDING. LOSS OF ALL CAPABILITY FOR DETERMINING RANGE PLUS BEARING OR RANGE ONLY VIA LIKE AND UNLIKE REDUNDANCY COULD CAUSE LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY, TWO OTHER TACAN UNITS, AND UNLIKE-REDUNDANCY FOR DETERMINING RANGE AND BEARING EXISTS VIA THE GN&C SUBSYSTEM AND STARTING 15 NM FROM LANDING VIA THE MSBLS.) INTERMITTENT OR ERRATIC DATA WOULD BE THROWN OUT SO THAT RANGE AND BEARING WOULD BE LOST FOR THIS TACAN UNIT.

REFERENCES: SYSTEM SCHEMATIC VS 70-740179, SSSH 9.2, OMRS NSTS 08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 1

REPORT DATE 12/31/87

C-445

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/05/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7003 ABORT: 3/1R

ITEM: TACAN  
FAILURE MODE: FAILS OUT OF TOLERANCE

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) TACAN
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: 1 UNIT BAY 1, 1 UNIT BAY 2, 1 UNIT BAY 3A  
PART NUMBER: MC409-0014-0006

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

TRIPLE REDUNDANT TACAN UNITS, IN THREE SINGLE STRINGS, OPERATE SIMULTANEOUSLY TO PROVIDE SLANT RANGE AND BEARING INFORMATION DURING DEORBIT FROM 160,000 FEET ALT DOWN TO 1500 FEET ALT OR 15 NM FROM LANDING. LOSS OF ALL CAPABILITY FOR DETERMINING RANGE PLUS BEARING OR RANGE ONLY VIA LIKE AND UNLIKE REDUNDANCY COULD CAUSE LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY, TWO OTHER TACAN UNITS, AND UNLIKE-REDUNDANCY FOR DETERMINING RANGE AND BEARING EXISTS VIA THE GN&C SUBSYSTEM AND STARTING 15 NM FROM LANDING VIA THE MSBLS.) OUT OF TOLERANCE DATA IS THROWN OUT SO THAT BEARING AND RANGE WILL BE LOST FOR THIS TACAN UNIT.

REFERENCES: SYSTEM SCHEMATIC VS 70-740179, SSSH 9.2, OMRS NSTS 08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 1

REPORT DATE 12/31/87

C-446

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/05/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7004 ABORT: 3/1R

ITEM: MODE SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) TACAN
- 4) MODE SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL 07  
PART NUMBER: PANEL 07, V070-730245 S1, S3, S5

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

TRIPLE REDUNDANT TACAN UNITS, IN THREE SINGLE STRINGS INCLUDING DEDICATED CONTROLS, OPERATE SIMULTANEOUSLY TO PROVIDE SLANT RANGE AND BEARING INFORMATION DURING DEORBIT FROM 160,000 FEET ALT DOWN TO 1500 FEET ALT OR 15 NM FROM LANDING. LOSS OF ALL CAPABILITY FOR DETERMINING RANGE PLUS BEARING OR RANGE ONLY VIA LIKE AND UNLIKE REDUNDANCY COULD CAUSE LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY, TWO OTHER TACAN UNITS, AND UNLIKE-REDUNDANCY FOR DETERMINING RANGE AND BEARING VIA THE GN&C SUBSYSTEM AND STARTING 15 NM FROM LANDING VIA THE MSBLS.) THE MODE SW MANUALLY SELECTS OFF, RCV, T/R, OR GPS CMD MODE. FAILURE TO SELECT T/R OR GPC MODE WOULD CAUSE SW TO REMAIN IN OFF OR RCV RESULTING IN LOSS OF TACAN CAPABILITY.

REFERENCES: SYSTEM SCHEMATIC VS 70-740179, SSSH 9.2, OMRS NSTS 08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 1

REPORT DATE 12/31/87

C-447

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/05/87  
SUBSYSTEM: COMM AND TRACK  
MDAC ID: 7005

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: MODE SWITCH  
FAILURE MODE: ELECTRICAL OPEN

LEAD ANALYST: W.C. LONG

SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) TACAN
- 4) MODE SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL 07

PART NUMBER: PANEL 07, V070-730245 S1, S3, S5

CAUSES: MECHNICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

TRIPLE REDUNDANT TACAN UNITS, IN THREE SINGLE STRINGS INCLUDING DEDICATED CONTROLS, OPERATE SIMULTANEOUSLY TO PROVIDE SLANT RANGE AND BEARING INFORMATION DURING DEORBIT FROM 160,000 FEET ALT DOWN TO 1500 FEET ALT OR 15 NM FROM LANDING. LOSS OF ALL RANGE PLUS BEARING OR RANGE ONLY VIA LIKE AND UNLIKE REDUNDANCY COULD CAUSE LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY, TWO OTHER TACAN STRINGS, AND UNLIKE VIA GPCV CMD AND FOR DETERMINING RANGE AND BEARING VIA THE GN&C SUBSYSTEM AND STARTING 15 NM FROM LANDING VIA THE MSBLS.) THE MODE SW MANUALLY SELECTS OFF, RCV, T/R OR GPC CMD MODE. AN OPEN MODE SWITCH WOULD RESULT IN LOSS OF RANGE AND BEARING FROM THE ASSOCIATED TACAN UNIT.

REFERENCES: SYSTEM SCHEMATIC VS 70-740179, SSSH 9.2, OMRS NSTS 08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 1

REPORT DATE 12/31/87

C-448



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/05/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7006 ABORT: 3/1R

ITEM: ANTENNA SELECT SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) TACAN
- 4) ANTENNA SELECT SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL 07  
PART NUMBER: PANEL 07, V070-730245 S2, S4, S6

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

TRIPLE REDUNDANT TACAN UNITS, IN THREE SINGLE STRINGS INCLUDING DEDICATED CONTROLS, OPERATE SIMULTANEOUSLY TO PROVIDE SLANT RANGE AND BEARING INFORMATION DURING DEORBIT FROM 160,000 FEET ALT DOWN TO 1500 FEET ALT OR 15 NM FROM LANDING. LOSS OF ALL RANGE PLUS BEARING OR RANGE ONLY VIA LIKE AND UNLIKE REDUNDANCY COULD CAUSE LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY, TWO OTHER TACAN STRINGS, AND UNLIKE VIA GPC CMD AND FOR DETERMINING RANGE AND BEARING VIA THE GN&C SUBSYSTEM AND STARTING 15 NM FROM LANDING VIA THE MSBLS.) SW SELECTS UPPER, AUTO OR LOWER ANT. FAILURE TO SWITCH FROM UPPER ANTENNA COULD CAUSE LOSS OF RANGE AND BEARING DATA DUE TO INTERMITTENT SIGNAL RECEPTION.

REFERENCES: SYSTEM SCHEMATIC VS 70-740179, SSSH 9.2, OMRS NSTS 08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 1

REPORT DATE 12/31/87

C-449

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7007 ABORT: 3/1R

ITEM: ANTENNA SELECT SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) TACAN
- 4) ANTENNA SELECT SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL 07  
PART NUMBER: PANEL 07, V070-730245 S2, S4, S6

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

TRIPLE REDUNDANT TACAN UNITS, IN THREE SINGLE STRINGS INCLUDING DEDICATED CONTROLS, OPERATE SIMULTANEOUSLY TO PROVIDE SLANT RANGE AND BEARING INFORMATION DURING DEORBIT FROM 160,000 FEET ALT DOWN TO 1500 FEET ALT OR 15 NM FROM LANDING. LOSS OF ALL RANGE PLUS BEARING OR RANGE ONLY VIA LIKE AND UNLIKE REDUNDANCY COULD CAUSE LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY, TWO OTHER TACAN STRINGS, AND UNLIKE VIA GPC CMD AND FOR DETERMINING RANGE AND BEARING VIA THE GN&C SUBSYSTEM AND STARTING 15 NM FROM LANDING VIA THE MSBLS.) SW SELECTS UPPER, AUTO OR LOWER ANT. AN OPEN/SHORT WOULD PREVENT SIGNAL RECEPTION RESULTING IN LOSS OF TACAN CAPABILITY.

REFERENCES: SYSTEM SCHEMATIC VS 70-740179, SSSH 9.2, OMRS NSTS 08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 1

REPORT DATE 12/31/87

C-450

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7008 ABORT: 3/1R

ITEM: CHANNEL SELECT SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) TACAN
- 4) CHANNEL SELECT SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL 07  
PART NUMBER: PANEL 07, V070-730245 S7, S8, S9

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

TRIPLE REDUNDANT TACAN UNITS, IN THREE SINGLE STRINGS INCLUDING DEDICATED CONTROLS, OPERATE SIMULTANEOUSLY TO PROVIDE SLANT RANGE AND BEARING INFORMATION DURING DEORBIT FROM 160,000 FEET ALT DOWN TO 1500 FEET ALT OR 15 NM FROM LANDING. LOSS OF ALL RANGE PLUS BEARING OR RANGE ONLY VIA LIKE AND UNLIKE REDUNDANCY COULD CAUSE LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY, TWO OTHER TACAN STRINGS, AND UNLIKE VIA GPC CMD AND FOR DETERMINING RANGE AND BEARING VIA THE GN&C SUBSYSTEM AND STARTING 15 NM FROM LANDING VIA THE MSBLS.) AN OPEN/SHORT WOULD PREVENT CHANNEL OR X/Y MODE SELECTION CAUSING LOSS OF REQUIRED TACAN GROUND STATION SIGNALS RECEPTION RESULTING IN LOSS OF TAQCAN DATA.

REFERENCES: SYSTEM SCHEMATIC VS 70-740179, SSSH 9.2, OMRS NSTS 08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 1

REPORT DATE 12/31/87 C-451

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/05/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7009 ABORT: 3/1R

ITEM: CHANNEL SELECT SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) TACAN
- 4) CHANNEL SELECT SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL 07  
PART NUMBER: PANEL 07, V070-730245 S7, S8, S9

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

TRIPLE REDUNDANT TACAN UNITS, IN THREE SINGLE STRINGS INCLUDING DEDICATED CONTROLS, OPERATE SIMULTANEOUSLY TO PROVIDE SLANT RANGE AND BEARING INFORMATION DURING DEORBIT FROM 160,000 FEET ALT DOWN TO 1500 FEET ALT OR 15 NM FROM LANDING. LOSS OF ALL RANGE PLUS BEARING OR RANGE ONLY VIA LIKE AND UNLIKE REDUNDANCY COULD CAUSE LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY, TWO OTHER TACAN STRINGS, AND UNLIKE VIA GPC CMD AND FOR DETERMINING RANGE AND BEARING VIA THE GN&C SUBSYSTEM AND STARTING 15 NM FROM LANDING VIA THE MSBLS.) FAILURE TO SELECT CORRECT CHANNELS OR X/Y MODE WOULD CAUSE LOSS OF REQUIRED TACAN GROUND STATION SIGNALS RECEPTION RESULTING IN LOSS OF TACAN DATA.

REFERENCES: SYSTEM SCHEMATIC VS 70-740179, SSSH 9.2, OMRS NSTS 08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 1

REPORT DATE 12/31/87

C-452

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/05/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7010 ABORT: 3/1R

ITEM: MSBLS  
FAILURE MODE: FAILS OUT OF TOLERANCE

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) MSBLS
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: 1 SET BAY 1, 2 SETS IN BAR 2  
PART NUMBER: MC409-0017-0007 RF ASSY, MC409-0017-0003 RF ASSY,  
MC409-0017-0008 DECODER ASSY, MC409-0017-0006 DECODER ASSY

CAUSES: CONTAMINATION, PIECE PART FAILURE, TEMPERATURE, LOSS OF  
INPUT. MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

TRIPLE REDUNDANT MSBLS SETS, IN THREE SINGLE STRINGS, OPERATE  
SIMULTANEOUSLY TO PROVIDE SLANT RANGE, AZIMUTH AND ELEVATION  
ANGLES FROM 15 NM OUT THROUGH LANDING. LOSS OF ALL CAPABILITY  
FOR DETERMINING PARAMETERS VIA LIKE AND UNLIKE REDUNDANCY COULD  
CAUSE LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY, TWO OTHER  
MSBLS SETS, AND UNLIKE-REDUNDANCY EXISTS VIA THE GN&C SUBSYSTEM,  
SLANT RANGE AND BEARING DOWN TO 1500 FT VIA THE TACAN AND  
ALTITUDE VIA THE RADAR AND BAROMETRIC ALTIMETERS FROM 5000 FT TO  
TOUCHDOWN.) THE GPC SOP WILL BLOCK USE OF DATA FROM AN MSBLS SET  
WHEN OUT OF TOLERANCE ERRORS EXCEED LIMITS.

REFERENCES: SYSTEM SCHEMATIC VS 70-740569, SSSH 9.4, OMRS NSTS  
08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 2.

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7011 ABORT: 3/1R

ITEM: MSBLS RF ASSEMBLY  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) MSBLS
- 4) RF ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: 1 SET BAY 1, 2 SETS IN BAY 2  
PART NUMBER: MC409-0017-0007 RF ASSY, MC409-0017-0003 RF ASSY

CAUSES: CONTAMINATION, PIECE PART FAILURE, TEMPERATURE, LOSS OF INPUT. MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

TRIPLE REDUNDANT MSBLS SETS, IN THREE SINGLE STRINGS, OPERATE SIMULTANEOUSLY TO PROVIDE SLANT RANGE, AZIMUTH AND ELEVATION ANGLES FROM 15 NM OUT THROUGH LANDING. LOSS OF ALL CAPABILITY FOR DETERMINING PARAMETERS VIA LIKE AND UNLIKE REDUNDANCY COULD CAUSE LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY, TWO OTHER MSBLS SETS, AND UNLIKE-REDUNDANCY EXISTS VIA THE GN&C SUBSYSTEM, SLANT RANGE AND BEARING DOWN TO 1500 FT VIA THE TACAN, AND ALTITUDE VIA THE RADAR AND BAROMETRIC ALTIMETERS FROM 5000 FT TO TOUCHDOWN.) THE GPC SOP WILL BLOCK USE OF DATA FROM AN MSBLS SET WHEN RANGE DATA IS LOST. LOSS OF RF ASSEMBLY RESULTS IN LOSS OF MSBLS DATA.

REFERENCES: SYSTEM SCHEMATIC VS 70-740569, SSSH 9.4, OMRS NSTS 08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 2.

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7012 ABORT: 3/1R

ITEM: MSBLS RF ASSEMBLY  
FAILURE MODE: INTERMITTENT AND ERRATIC OPERATION

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) MSBLS
- 4) RF ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: 1 SET BAY 1, 2 SETS IN BAR 2  
PART NUMBER: MC409-0017-0007 RF ASSY, MC409-0017-0003 RF ASSY

CAUSES: CONTAMINATION, PIECE PART FAILURE, TEMPERATURE, LOSS OF INPUT. MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

TRIPLE REDUNDANT MSBLS SETS, IN THREE SINGLE STRINGS, OPERATE SIMULTANEOUSLY TO PROVIDE SLANT RANGE, AZIMUTH AND ELEVATION ANGLES FROM 15 NM OUT THROUGH LANDING. LOSS OF ALL CAPABILITY FOR DETERMINING PARAMETERS VIA LIKE AND UNLIKE REDUNDANCY COULD CAUSE LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY, TWO OTHER MSBLS SETS, AND UNLIKE-REDUNDANCY EXIST VIA THE GN&C SUBSYSTEM, SLANT RANGE AND BEARING DOWN TO 1500 FT VIA THE TACAN AND ALTITUDE VIA THE RADAR AND BAROMETRIC ALTIMETERS FROM 5000 FT TO TOUCHDOWN.) THE GPC SOP WILL BLOCK INTERMITTENT OR ERRATIC DATA FROM AN MSBLS SET. RF ASSEMBLY PROVIDES TRANSMITTER FOR RANGING AND GND STATION INTERROGATION.

REFERENCES: SYSTEM SCHEMATIC VS 70-740569, SSSH 9.4, OMRS NSTS 08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 2.

REPORT DATE 12/31/87

C-455

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7013 ABORT: 3/1R

ITEM: MSBLS TRACKER/DECODER  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) MSBLS
- 4) TRACKER/DECODER
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/1R	
LIFTOFF:	3/3	TAL:	3/1R	
ONORBIT:	3/3	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	3/1R	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: 1 SET BAY 1, 2 SETS IN BAY 2  
PART NUMBER: MC409-0017-0008 DECODER ASSY, MC409-0017-0006  
DECODER ASSY

CAUSES: CONTAMINATION, PIECE PART FAILURE, TEMPERATURE, LOSS OF  
INPUT. MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

TRIPLE REDUNDANT MSBLS SETS, IN THREE SINGLE STRINGS, OPERATE  
SIMULTANEOUSLY TO PROVIDE SLANT RANGE, AZIMUTH AND ELEVATION  
ANGLES FROM 15 NM OUT THROUGH LANDING. LOSS OF ALL CAPABILITY  
FOR DETERMINING PARAMETERS VIA LIKE AND UNLIKE REDUNDANCY COULD  
CAUSE LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY, TWO OTHER  
MSBLS SETS, AND UNLIKE-REDUNDANCY EXISTS VIA THE GN&C SUBSYSTEM,  
SLANT RANGE AND BEARING DOWN TO 1500 FT VIA THE TACAN, AND  
ALTITUDE VIA THE RADAR AND BAROMETRIC ALTIMETERS FROM 5000 FT  
TO TOUCHDOWN.) THE GPC SOP WILL BLOCK USE OF DATA FROM AN MSBLS  
SET WHEN RANGE DATA IS LOST. LOSS OF TRACKER/DECODER RESULTS IN  
LOSS OF MSBLS DATA.

REFERENCES: SYSTEM SCHEMATIC VS 70-740569, SSSH 9.4, OMRS NSTS  
08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 2.

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7014 ABORT: 3/1R

ITEM: MSBLS TRACKER/DECODER  
FAILURE MODE: INTERMITTENT AND ERRATIC OPERATION

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) MSBLS
- 4) TRACKER/DECODER
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/1R	
LIFTOFF:	3/3	TAL:	3/1R	
ONORBIT:	3/3	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	3/1R	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: 1 SET BAY 1, 2 SETS IN BAR 2  
PART NUMBER: MC409-0017-0008 DECODER ASSY, MC409-0017-0006  
DECODER ASSY

CAUSES: CONTAMINATION, PIECE PART FAILURE, TEMPERATURE, LOSS OF  
INPUT. MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

TRIPLE REDUNDANT MSBLS SETS, IN THREE SINGLE STRINGS, OPERATE  
SIMULTANEOUSLY TO PROVIDE SLANT RANGE, AZIMUTH AND ELEVATION  
ANGLES FROM 15 NM OUT THROUGH LANDING. LOSS OF ALL CAPABILITY  
FOR DETERMINING PARAMETERS VIA LIKE AND UNLIKE REDUNDANCY COULD  
CAUSE LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY, TWO OTHER  
MSBLS SETS, AND UNLIKE-REDUNDANCY EXIST VIA THE GN&C SUBSYSTEM,  
SLANT RANGE AND BEARING DOWN TO 1500 FT VIA THE TACAN AND  
ALTITUDE VIA THE RADAR AND BAROMETRIC ALTIMETERS FROM 5000 FT TO  
TOUCHDOWN.) THE GPC SOP WILL BLOCK INTERMITTENT OR ERRATIC DATA  
FROM AN MSBLS SET. TRACKER/DECODER PROVIDES DATA PROCESSING TO  
DERIVE TRACKING PARAMETERS.

REFERENCES: SYSTEM SCHEMATIC VS 70-740569, SSSH 9.4, OMRS NSTS  
08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 2.

REPORT DATE 12/31/87 C-457

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7015 ABORT: 3/1R

ITEM: MLS POWER SWITCH  
FAILURE MODE: FAILS TO CLOSE

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) MSBLS
- 4) MLS PWR SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL 08  
PART NUMBER: S8, S9, S10

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

TRIPLE REDUNDANT MSBLS SETS, IN THREE SINGLE STRINGS INCLUDING DEDICATED CONTROLS, OPERATE SIMULTANEOUSLY TO PROVIDE SLANT RANGE, AZIMUTH AND ELEVATION ANGLES FROM 15 NM OUT THROUGH LANDING. LOSS OF ALL CAPABILITY FOR DETERMINING PARAMETERS VIA LIKE

AND UNLIKE REDUNDANCY COULD CAUSE LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY, TWO OTHER MSBLS STRINGS, AND UNLIKE VIA THE GN&C SUBSYSTEM, SLANT RANGE AND BEARING VIA THE TACAN DOWN TO 1500 FT AND ALTITUDE VIA THE RADAR AND BAROMETRIC ALTIMETERS FROM 5000 FT TO TOUCHDOWN.) FAILURE TO CLOSE THE MLS PWR SW WOULD RESULT IN LOSS OF MSBLS DATA. NO GPC BYPASS MODE.

REFERENCES: SYSTEM SCHEMATIC VS 70-740569, SSSH 9.4, OMRS NSTS 08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 2.

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7016 ABORT: 3/1R

ITEM: MLS POWER SWITCH  
FAILURE MODE: FAILS TO REMAIN CLOSED

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) MSBLS
- 4) MLS PWR SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/1R
LIFTOFF:	3/3		TAL:	3/1R
ONORBIT:	3/3		AOA:	3/1R
DEORBIT:	3/1R		ATO:	3/1R
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL 08  
PART NUMBER: S8, S9, S10

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

TRIPLE REDUNDANT MSBLS SETS, IN THREE SINGLE STRINGS INCLUDING DEDICATED CONTROLS, OPERATE SIMULTANEOUSLY TO PROVIDE SLANT RANGE, AZIMUTH AND ELEVATION ANGLES FROM 15 NM OUT THROUGH LANDING. LOSS OF ALL CAPABILITY FOR DETERMINING PARAMETERS VIA LIKE

AND UNLIKE REDUNDANCY COULD CAUSE LOSS OF VEHICLE AND CREW.

(LIKE REDUNDANCY, TWO OTHER MSBLS SETS, AND UNLIKE-REDUNDANCY EXISTS VIA THE GN&C SUBSYSTEM, SLANT RANGE AND BEARING DOWN TO 1500 FT VIA THE TACAN AND ALTITUDE VIA THE RADAR AND BAROMETRIC ALTIMETERS FROM 5000 FT TO TOUCHDOWN.) FAILURE OF THE MLS PWR SW TO REMAIN CLOSED WOULD RESULT IN LOSS OF MSBLS DATA. NO GPC BYPASS MODE.

REFERENCES: SYSTEM SCHEMATIC VS 70-740569, SSSH 9.4, OMRS NSTS 08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 2.

REPORT DATE 12/31/87

C-459

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/27/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7017 ABORT: 3/1R

ITEM: MLS POWER SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) MSBLS
- 4) MLS PWR SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL 08  
PART NUMBER: S8, S9, S10

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

TRIPLE REDUNDANT MSBLS SETS, IN THREE SINGLE STRINGS INCLUDING DEDICATED CONTROLS, OPERATE SIMULTANEOUSLY TO PROVIDE SLANT RANGE, AZIMUTH AND ELEVATION ANGLES FROM 15 NM OUT THROUGH LANDING. LOSS OF ALL CAPABILITY FOR DETERMINING PARAMETERS VIA LIKE AND UNLIKE REDUNDANCY COULD CAUSE LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY, TWO OTHER MSBLS STRINGS, AND UNLIKE VIA THE GN&C SUBSYSTEM, SLANT RANGE AND BEARING VIA THE TACAN DOWN TO 1500 FT AND ALTITUDE VIA THE RADAR AND BAROMETRIC ALTIMETERS FROM 5000 FT TO TOUCHDOWN.) OPEN/SHORT WOULD PREVENT USE OF MLS PWR SW RESULTING IN LOSS OF MSBLS DATA. NO GPC BYPASS MODE

REFERENCES: SYSTEM SCHEMATIC VS 70-740569, SSSH 9.4, OMRS NSTS 08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 2.

REPORT DATE 12/31/87

C-460

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/05/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7018 ABORT: 3/1R

ITEM: MLS CHANNEL SELECT SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) MSBLS
- 4) MLS CHANNEL SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL 08  
PART NUMBER: S11

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

TRIPLE REDUNDANT MSBLS SETS, IN THREE SINGLE STRINGS INCLUDING DEDICATED CONTROLS, OPERATE SIMULTANEOUSLY TO PROVIDE SLANT RANGE, AZIMUTH AND ELEVATION ANGLES FROM 15 NM OUT THROUGH LANDING. LOSS OF ALL CAPABILITY FOR DETERMINING PARAMETERS VIA LIKE

AND UNLIKE REDUNDANCY COULD CAUSE LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY, TWO OTHER MSBLS STRINGS, AND UNLIKE VIA THE GN&C SUBSYSTEM, SLANT RANGE AND BEARING VIA THE TACAN DOWN TO 1500 FT AND ALTITUDE VIA THE RADAR AND BAROMETRIC ALTIMETERS FROM 5000 FT TO TOUCHDOWN.) THE MLS CH SELECT SW PICKS THE OPERATIONAL MSBLS CH. FAILURE TO SW WOULD RESULT IN LOSS OF MSBLS CAP. NO GPC BYPASS MODE.

REFERENCES: SYSTEM SCHEMATIC VS 70-740569, SSSH 9.4, OMRS NSTS 08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 2.

REPORT DATE 12/31/87

C-461

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/27/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7019 ABORT: 3/1R

ITEM: MLS CHANNEL SELECT SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) MSBLS
- 4) MLS CHANNEL SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL 08  
PART NUMBER: S11

CAUSES: MECHANICAL SHORT, VIBRATION

EFFECTS/RATIONALE:

TRIPLE REDUNDANT MSBLS SETS, IN THREE SINGLE STRINGS INCLUDING DEDICATED CONTROLS, OPERATE SIMULTANEOUSLY TO PROVIDE SLANT RANGE, AZIMUTH AND ELEVATION ANGLES FROM 15 NM OUT THROUGH LANDING. LOSS OF ALL CAPABILITY FOR DETERMINING PARAMETERS VIA LIKE

AND UNLIKE REDUNDANCY COULD CAUSE LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY, TWO OTHER MSBLS STRINGS, AND UNLIKE VIA THE GN&C SUBSYSTEM, SLANT RANGE AND BEARING VIA THE TACAN DOWN TO 1500 FT AND ALTITUDE VIA THE RADAR AND BAROMETRIC ALTIMETERS FROM 5000 FT TO TOUCHDOWN.) THE MLS CH SELECT SW USED TO PICK MSBLS OPERATIONAL CH. OPEN/SHORT WOULD PREVENT CH SELECTION CAUSING LOSS OF MSBLS CAP. NO GPC BYPASS MODE.

REFERENCES: SYSTEM SCHEMATIC VS 70-740569, SSSH 9.4, OMRS NSTS 08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 2.

REPORT DATE 12/31/87

C-462

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/06/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7020 ABORT: 3/1R

ITEM: RADAR ALTIMETER  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) RADAR ALTIMETER
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: 1 UNIT BAY 1, 1 UNIT IN BAY 2  
PART NUMBER: MC409-0015-0004

CAUSES: CONTAMINATION, PIECE PART FAILURE, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

DUAL REDUNDANT RADAR ALTIMETER UNITS, IN TWO SINGLE STRINGS, OPERATE SIMULTANEOUSLY TO PROVIDE ALTITUDE DURING THE DEORBIT PHASE FROM 5000 FT TO TOUCHDOWN. LOSS OF ALL CAPABILITY FOR DETERMINING ALTITUDE VIA LIKE OR UNLIKE REDUNDANCY COULD CAUSE LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY EXISTS VIA ANOTHER RADAR ALTIMETER UNIT, AND UNLIKE REDUNDANCY FOR DETERMINING ALTITUDE EXISTS VIA THE GN&C SUBSYSTEM AND THE BAROMETRIC ALTIMETER.)

REFERENCES: SYSTEM SCHEMATIC VS70-740159, SSSH 9.3, OMRS NSTS 08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 3.

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/06/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7021 ABORT: 3/1R

ITEM: RADAR ALTIMETER  
FAILURE MODE: FAILS OUT OF TOLERANCE

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) RADAR ALTIMETER
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/1R	
LIFTOFF:	3/3	TAL:	3/1R	
ONORBIT:	3/3	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	3/1R	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: 1 UNIT BAY 1, 1 UNIT IN BAY 2  
PART NUMBER: MC409-0015-0004

CAUSES: CONTAMINATION, PIECE PART FAILURE, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

DUAL REDUNDANT RADAR ALTIMETER UNITS, IN TWO SINGLE STRINGS, OPERATE SIMULTANEOUSLY TO PROVIDE ALTITUDE DURING THE DEORBIT PHASE FROM 5000 FT TO TOUCHDOWN. LOSS OF ALL CAPABILITY FOR DETERMINING ALTITUDE VIA LIKE OR UNLIKE REDUNDANCY COULD CAUSE LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY EXISTS VIA ANOTHER RADAR ALTIMETER UNIT, AND UNLIKE REDUNDANCY FOR DETERMINING ALTITUDE EXISTS VIA THE GN&C SUBSYSTEM AND THE BAROMETRIC ALTIMETER.) OUT OF TOLERANCE MEASUREMENTS WILL CAUSE AVVI FLAG TO REGISTER DATA BAD. THE SIGNAL/ALTITUDE MEASUREMENT FOR THIS RA WILL BE BLOCKED OUT BY THE GPC SOP.

REFERENCES: SYSTEM SCHEMATIC VS70-740159, SSSH 9.3, OMRS NSTS 08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 3.

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/06/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7022 ABORT: 3/1R

ITEM: RADAR ALTIMETER  
FAILURE MODE: INTERMITTENT AND ERRATIC OPERATION

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) RADAR ALTIMETER
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: 1 UNIT BAY 1, 1 UNIT IN BAY 2  
PART NUMBER: MC409-0015-0004

CAUSES: CONTAMINATION, PIECE PART FAILURE, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, NOSE WHEEL REFLECTIONS

EFFECTS/RATIONALE:

DUAL REDUNDANT RADAR ALTIMETER UNITS, IN TWO SINGLE STRINGS, OPERATE SIMULTANEOUSLY TO PROVIDE ALTITUDE DURING THE DEORBIT PHASE FROM 5000 FT TO TOUCHDOWN. LOSS OF ALL CAPABILITY FOR DETERMINING ALTITUDE VIA LIKE OR UNLIKE REDUNCY COULD CAUSE LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY EXISTS VIA ANOTHER RADAR ALTIMETER UNIT, AND UNLIKE REDUNDANCY FOR DETERMINING ALTITUDE EXISTS VIA THE GN&C SUBSYSTEM AND THE BAROMETRIC ALTIMETER.) INTERMITTENT OR ERRATIC DATA RESULTS IN LOSS OF ALTITUDE DATA FROM THIS RADAR ALTIMETER.

REFERENCES: SYSTEM SCHEMATIC VS70-740159, SSSH 9.3, OMRS NSTS 08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 3.

REPORT DATE 12/31/87

C-465

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/06/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7023 ABORT: 3/1R

ITEM: RA PWR SWITCH  
FAILURE MODE: FAILS TO CLOSE

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) RADAR ALTIMETER
- 4) RA PWR SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL 08  
PART NUMBER: V070-730296 S4, S5

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

DUAL REDUNDANT RADAR ALTIMETER UNITS, IN TWO SINGLE STRINGS INCLUDING DEDICATED CONTROLS, OPERATE SIMULTANEOUSLY TO PROVIDE ALTITUDE DURING THE DEORBIT PHASE FROM 5000 FT TO TOUCHDOWN. LOSS OF ALL CAPABILITY FOR DETERMINING ALTITUDE VIA LIKE OR UNLIKE REDUNDANCY COULD CAUSE LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY EXISTS VIA ANOTHER RADAR ALTIMETER UNIT, AND UNLIKE REDUNDANCY FOR DETERMINING ALTITUDE EXISTS VIA THE GN&C SUBSYSTEM AND THE BAROMETRIC ALTIMETER.) NO ALTERNATE GPC CONTROL MODE. FAILURE TO APPLY PWR WOULD RESULT IN LOSS OF ALTITUDE DATA FROM THE ASSOCIATED RA.

REFERENCES: SYSTEM SCHEMATIC VS70-740159, SSSH 9.3, OMRS NSTS 08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 3.

REPORT DATE 12/31/87

C-466

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/06/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7024 ABORT: 3/1R

ITEM: RA PWR SWITCH  
FAILURE MODE: FAILS TO REMAIN CLOSED

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) RADAR ALTIMETER
- 4) RA PWR SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL 08  
PART NUMBER: V070-730296 S4, S5

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

DUAL REDUNDANT RADAR ALTIMETER UNITS, IN TWO SINGLE STRINGS INCLUDING DEDICATED CONTROLS, OPERATE SIMULTANEOUSLY TO PROVIDE ALTITUDE DURING THE DEORBIT PHASE FROM 5000 FT TO TOUCHDOWN. LOSS OF ALL CAPABILITY FOR DETERMINING ALTITUDE VIA LIKE OR UNLIKE REDUNDANCY COULD CAUSE LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY EXISTS VIA ANOTHER RADAR ALTIMETER STRING, AND UNLIKE REDUNDANCY FOR DETERMINING ALTITUDE EXISTS VIA THE GN&C SUBSYSTEM AND THE BAROMETRIC ALTIMETER.) NO ALTERNATE GPC CONTROL MODE. FAILURE OF PWR SW TO REMAIN CLOSED WOULD RESULT IN LOSS OF ALTITUDE DATA FROM THE ASSOCIATED RA.

REFERENCES: SYSTEM SCHEMATIC VS70-740159, SSSH 9.3, OMRS NSTS 08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 3.

REPORT DATE 12/31/87

C-467

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/27/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7025 ABORT: 3/1R

ITEM: RA PWR SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) RADAR ALTIMETER
- 4) RA PWR SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL 08  
PART NUMBER: V070-730296 S4, S5

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

DUAL REDUNDANT RADAR ALTIMETER UNITS, IN TWO SINGLE STRINGS INCLUDING DEDICATED CONTROLS, OPERATE SIMULTANEOUSLY TO PROVIDE ALTITUDE DURING THE DEORBIT PHASE FROM 5000 FT TO TOUCHDOWN. LOSS OF ALL CAPABILITY FOR DETERMINING ALTITUDE VIA LIKE OR UNLIKE REDUNDANCY COULD CAUSE LOSS OF VEHICLE AND CREW. (LIKE REDUNDANCY EXISTS VIA ANOTHER RADAR ALTIMETER UNIT, AND UNLIKE REDUNDANCY FOR DETERMINING ALTITUDE EXISTS VIA THE GN&C SUBSYSTEM AND THE BAROMETRIC ALTIMETER.) NO ALTERNATE GPC CONTROL MODE. OPEN/SHORT PWR SW WOULD RESULT IN LOSS OF ALTITUDE DATA FROM THE ASSOCIATED RA.

REFERENCES: SYSTEM SCHEMATIC VS70-740159, SSSH 9.3, OMRS NSTS 08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 3.

REPORT DATE 12/31/87

C-468

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/06/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/2  
MDAC ID: 7026 ABORT: 3/3

ITEM: RENDEZVOUS RADAR  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) KU-BAND COMM/RADAR
- 4) RENDEZVOUS RADAR
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: BAY 3A, BAY 3B, AND PAYLOAD BAY  
PART NUMBER: EA1 MC409-0025-1001, EA2 MC409-0025-2001, DA  
MC409-0025-3001, KU SPA MC409-0025-4001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, TEMPERATURE,  
LOSS OF INPUT, PIECE PART FAILURE

EFFECTS/RATIONALE:

THE RENDEZVOUS RADAR SECTION OF THE KU-BAND COMM/RADAR SYSTEM OPERATES IN A SINGLE STRING CONFIGURATION TO SEARCH, ACQUIRE, AND TRACK DETACHED PAYLOADS WITHIN 12 NM OF THE ORBITER. THE RADAR PROVIDES TARGET DATA CONSISTING OF RANGE, RANGE RATE, ANGLE AND ANGLE RATE DURING RENDEZVOUS MANEUVERS. LOSS OF ALL CAPABILITY FOR DETERMINING THIS INFORMATION COULD RESULT IN LOSS OF PAYLOAD RECOVERY CAPABILITY WHICH COULD RESULT IN LOSS OF MISSION. (UNLIKE-REDUNDANCY FOR OBTAINING TARGET ANGLES EXISTS VIA VIA THE STAR TRACKER AND COAS.) LOSS OF RADAR DATA WOULD CAUSE LOSS OF TRACKING CAPABILITY RESULTING IN POSSIBLE LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87 C-469

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/06/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/2  
MDAC ID: 7027 ABORT: 3/3

ITEM: RENDEZVOUS RADAR  
FAILURE MODE: FAILS OUT OF TOLERANCE

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) KU-BAND COMM/RADAR
- 4) RENDEZVOUS RADAR
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: BAY 3A, BAY 3B, AND PAYLOAD BAY  
PART NUMBER: EA1 MC409-0025-1001, EA2 MC409-0025-2001, DA  
MC409-0025-3001, KU SPA MC409-0025-4001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, TEMPERATURE,  
LOSS OF INPUT, PIECE PART FAILURE

EFFECTS/RATIONALE:

THE RENDEZVOUS RADAR SECTION OF THE KU-BAND COMM/RADAR SYSTEM OPERATES IN A SINGLE STRING CONFIGURATION TO SEARCH, ACQUIRE, AND TRACK DETACHED PAYLOADS WITHIN 12 NM OF THE ORBITER. THE RADAR PROVIDES TARGET DATA CONSISTING OF RANGE, RANGE RATE, ANGLE AND ANGLE RATE DURING RENDEZVOUS MANEUVERS. LOSS OF ALL CAPABILITY FOR DETERMINING THIS INFORMATION COULD RESULT IN LOSS OF PAYLOAD RECOVERY CAPABILITY WHICH COULD RESULT IN LOSS OF MISSION. (UNLIKE-REDUNDANCY FOR OBTAINING TARGET ANGLES EXISTS VIA THE STAR TRACKER AND COAS.) RADAR DATA EXCEEDING TOLERANCE LIMITS COULD RESULT IN LOSS OF TRACKING CAPABILITY AND SUBSEQUENT LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

C-470

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/06/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/2  
MDAC ID: 7028 ABORT: 3/3

ITEM: RR EA-1 (INTERFACE AND CONTROL UNIT) [REF KU COMM]  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) KU-BAND COMM/RADAR
- 4) RENDEZVOUS RADAR (RR)
- 5) EA-1 INTERFACE AND CONTROL UNIT
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	2/2		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: BAY 3A  
PART NUMBER: EA1 MC409-0025-1001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, TEMPERATURE,  
LOSS OF INPUT, PIECE PART FAILURE

EFFECTS/RATIONALE:

THE RENDEZVOUS RADAR SECTION OF THE KU-BAND COMM/RADAR SYSTEM OPERATES IN A SINGLE STRING CONFIGURATION TO SEARCH, ACQUIRE, AND TRACK DETACHED PAYLOADS WITHIN 12 NM OF THE ORBITER. THE RADAR PROVIDES TARGET DATA CONSISTING OF RANGE, RANGE RATE, ANGLE AND ANGLE RATE DURING RENDEZVOUS MANEUVERS. LOSS OF ALL CAPABILITY FOR DETERMINING THIS INFORMATION COULD RESULT IN LOSS OF PAYLOAD RECOVERY CAPABILITY WHICH COULD RESULT IN LOSS OF MISSION. (UNLIKE-REDUNDANCY FOR OBTAINING TARGET ANGLES EXISTS VIA THE STAR TRACKER AND COAS.) FAILURE OF EA-1 RESULTS IN LOSS OF RR CAP AND POSSIBLE LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87 C-471

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/06/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/2  
MDAC ID: 7029 ABORT: 3/3

ITEM: RR EA-2 (RADAR SIGNAL PROCESSOR)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) KU-BAND COMM/RADAR
- 4) RENDEZVOUS RADAR (RR)
- 5) EA-2 RADAR SIGNAL PROCESSOR
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: BAY 3A  
PART NUMBER: EA2 MC409-0025-2001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, TEMPERATURE,  
LOSS OF INPUT, PIECE PART FAILURE

EFFECTS/RATIONALE:

THE RENDEZVOUS RADAR SECTION OF THE KU-BAND COMM/RADAR SYSTEM OPERATES IN A SINGLE STRING CONFIGURATION TO SEARCH, ACQUIRE, AND TRACK DETACHED PAYLOADS WITHIN 12 NM OF THE ORBITER. THE RADAR PROVIDES TARGET DATA CONSISTING OF RANGE, RANGE RATE, ANGLE AND ANGLE RATE DURING RENDEZVOUS MANEUVERS. LOSS OF ALL CAPABILITY FOR DETERMINING THIS INFORMATION COULD RESULT IN LOSS OF PAYLOAD RECOVERY CAPABILITY WHICH COULD RESULT IN LOSS OF MISSION. (UNLIKE-REDUNDANCY FOR OBTAINING TARGET ANGLES EXISTS VIA THE STAR TRACKER AND COAS.) FAILURE OF EA-2 RESULTS IN LOSS OF RR CAP AND POSSIBLE LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87 C-472



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/06/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/2  
MDAC ID: 7030 ABORT: 3/3

ITEM: RR DEA (DEPLOYED ELECTRONIC ASSY) [REF KU COMM]  
FAILURE MODE: LOSS, OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) KU-BAND COMM/RADAR
- 4) RENDEZVOUS RADAR (RR)
- 5) DA
- 6) DEA
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY  
PART NUMBER: DA MC409-0025-3001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, TEMPERATURE,  
LOSS OF INPUT, PIECE PART FAILURE

EFFECTS/RATIONALE:

THE RENDEZVOUS RADAR SECTION OF THE KU-BAND COMM/RADAR SYSTEM OPERATES IN A SINGLE STRING CONFIGURATION TO SEARCH, ACQUIRE, AND TRACK DETACHED PAYLOADS WITHIN 12 NM OF THE ORBITER. THE RADAR PROVIDES TARGET DATA CONSISTING OF RANGE, RANGE RATE, ANGLE AND ANGLE RATE DURING RENDEZVOUS MANEUVERS. LOSS OF ALL CAPABILITY FOR DETERMINING THIS INFORMATION COULD RESULT IN LOSS OF PAYLOAD RECOVERY CAPABILITY WHICH COULD RESULT IN LOSS OF MISSION. (UNLIKE-REDUNDANCY FOR OBTAINING TARGET ANGLES EXISTS VIA THE STAR TRACKER AND COAS.) THE DEA CONTAINS THE TRANSMITTER AND RECEIVER. FAILURE OF DEA RESULTS IN LOSS OF RR CAP AND POSSIBLE LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87 C-473

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/27/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/2  
MDAC ID: 7031 ABORT: 3/3

ITEM: RR DEA (DEPLOYED ELECTRONIC ASSY) [REF KU COMM]  
FAILURE MODE: FAILS OUT OF TOLERANCE

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) KU-BAND COMM/RADAR
- 4) RENDEZVOUS RADAR (RR)
- 5) DA
- 6) DEA
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY  
PART NUMBER: DA MC409-0025-3001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, TEMPERATURE,  
LOSS OF INPUT, PIECE PART FAILURE

EFFECTS/RATIONALE:

THE RENDEZVOUS RADAR SECTION OF THE KU-BAND COMM/RADAR SYSTEM OPERATES IN A SINGLE STRING CONFIGURATION TO SEARCH, ACQUIRE, AND TRACK DETACHED PAYLOADS WITHIN 12 NM OF THE ORBITER. THE RADAR PROVIDES TARGET DATA CONSISTING OF RANGE, RANGE RATE, ANGLE AND ANGLE RATE DURING RENDEZVOUS MANEUVERS. LOSS OF ALL CAPABILITY FOR DETERMINING THIS INFORMATION COULD RESULT IN LOSS OF PAYLOAD RECOVERY CAPABILITY WHICH COULD RESULT IN LOSS OF MISSION. (UNLIKE-REDUNDANCY FOR OBTAINING TARGET ANGLES EXISTS VIA THE STAR TRACKER AND COAS.) THE DEA CONTAINS THE TRANSMITTER AND RECEIVER. EXCEEDING TOLERANCE LIMITS OF RCVR SENS/S/N RATIO AND LOW RF PWR OUTPUT COULD RESULT IN LOSS OF RR CAP AND POSSIBLE LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

C-474

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/28/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/2  
MDAC ID: 7032 ABORT: 3/3

ITEM: RR DMA (DEPLOYED MECHANICAL ASSY) [REF KU COMM]  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) KU-BAND COMM/RADAR
- 4) RENDEZVOUS RADAR (RR)
- 5) DA
- 6) DMA
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY  
PART NUMBER: DA MC409-0025-3001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, TEMPERATURE,  
LOSS OF INPUT, PIECE PART FAILURE

EFFECTS/RATIONALE:

THE RENDEZVOUS RADAR SECTION OF THE KU-BAND COMM/RADAR SYSTEM OPERATES IN A SINGLE STRING CONFIGURATION TO SEARCH, ACQUIRE, AND TRACK DETACHED PAYLOADS WITHIN 12 NM OF THE ORBITER. THE RADAR PROVIDES TARGET DATA CONSISTING OF RANGE, RANGE RATE, ANGLE AND ANGLE RATE DURING RENDEZVOUS MANEUVERS. LOSS OF ALL CAPABILITY FOR DETERMINING THIS INFORMATION COULD RESULT IN LOSS OF PAYLOAD RECOVERY CAPABILITY WHICH COULD RESULT IN LOSS OF MISSION. (UNLIKE-REDUNDANCY FOR OBTAINING TARGET ANGLES EXISTS VIA THE STAR TRACKER AND COAS.) THE DMA CONTAINS ANT GIMBAL MOTORS AND POINTING SENSORS. LOSS OF DMA OUTPUT PREVENTS TARGET POINTING DATA FEEDBACK FOR TRACKING. WOULD CAUSE LOSS OF RR CAP AND POSSIBLE LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87 C-475

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/06/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/2  
MDAC ID: 7033 ABORT: 3/3

ITEM: RR DMA (DEPLOYED MECHANICAL ASSY) [REF KU COMM]  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) KU-BAND COMM/RADAR
- 4) RENDEZVOUS RADAR (RR)
- 5) DMA
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY  
PART NUMBER: DA MC409-0025-3001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, TEMPERATURE,  
LOSS OF INPUT, PIECE PART FAILURE

EFFECTS/RATIONALE:

THE RENDEZVOUS RADAR SECTION OF THE KU-BAND COMM/RADAR SYSTEM OPERATES IN A SINGLE STRING CONFIGURATION TO SEARCH, ACQUIRE, AND TRACK DETACHED PAYLOADS WITHIN 12 NM OF THE ORBITER. THE RADAR PROVIDES TARGET DATA CONSISTING OF RANGE, RANGE RATE, ANGLE AND ANGLE RATE DURING RENDEZVOUS MANEUVERS. LOSS OF ALL CAPABILITY FOR DETERMINING THIS INFORMATION COULD RESULT IN LOSS OF PAYLOAD RECOVERY CAPABILITY WHICH COULD RESULT IN LOSS OF MISSION. (UNLIKE-REDUNDANCY FOR OBTAINING TARGET ANGLES EXISTS VIA THE STAR TRACKER AND COAS.) THE DMA CONTAINS ANT GIMBAL MOTORS ANT POINTING SENSORS. FAILURE OF DMA WOULD PREVENT TARGET TRACKING. WOULD CAUSE LOSS OF RR CAP AND POSSIBLE LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

C-476

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/28/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/2  
MDAC ID: 7034 ABORT: 3/3

ITEM: RR DMA (DEPLOYED MECHANICAL ASSY) [REF KU COMM]  
FAILURE MODE: FAILS TO START/STOP

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) KU-BAND COMM/RADAR
- 4) RENDEZVOUS RADAR (RR)
- 5) DA
- 6) DMA
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY  
PART NUMBER: DA MC409-0025-3001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, TEMPERATURE,  
LOSS OF INPUT, PIECE PART FAILURE

EFFECTS/RATIONALE:

THE RENDEZVOUS RADAR SECTION OF THE KU-BAND COMM/RADAR SYSTEM OPERATES IN A SINGLE STRING CONFIGURATION TO SEARCH, ACQUIRE, AND TRACK DETACHED PAYLOADS WITHIN 12 NM OF THE ORBITER. THE RADAR PROVIDES TARGET DATA CONSISTING OF RANGE, RANGE RATE, ANGLE AND ANGLE RATE DURING RENDEZVOUS MANEUVERS. LOSS OF ALL CAPABILITY FOR DETERMINING THIS INFORMATION COULD RESULT IN LOSS OF PAYLOAD RECOVERY CAPABILITY WHICH COULD RESULT IN LOSS OF MISSION. (UNLIKE-REDUNDANCY FOR OBTAINING TARGET ANGLES EXISTS VIA THE STAR TRACKER AND COAS.) THE DMA CONTAINS THE ANT GIMBAL MOTORS AND POINTING SENSORS. FAILURE TO START/STOP WOULD CAUSE LOSS OF DMA OUTPUT PREVENTING ANT TARGET TRACKING. WOULD CAUSE LOSS OF RR CAP AND POSSIBLE LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87 C-477

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/28/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/2  
MDAC ID: 7035 ABORT: 3/3

ITEM: RR DMA (DEPLOYED MECHANICAL ASSY) [REF KU COMM]  
FAILURE MODE: ERRATIC OPERATION

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) KU-BAND COMM/RADAR
- 4) RENDEZVOUS RADAR (RR)
- 5) DA
- 6) DMA
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY  
PART NUMBER: DA MC409-0025-3001

CAUSES: MECHANICAL SHOCK, VIBRATION, CONTAMINATION, TEMPERATURE,  
LOSS OF INPUT, PIECE PART FAILURE

EFFECTS/RATIONALE:

THE RENDEZVOUS RADAR SECTION OF THE KU-BAND COMM/RADAR SYSTEM OPERATES IN A SINGLE STRING CONFIGURATION TO SEARCH, ACQUIRE, AND TRACK DETACHED PAYLOADS WITHIN 12 NM OF THE ORBITER. THE RADAR PROVIDES TARGET DATA CONSISTING OF RANGE, RANGE RATE, ANGLE AND ANGLE RATE DURING RENDEZVOUS MANEUVERS. LOSS OF ALL CAPABILITY FOR DETERMINING THIS INFORMATION COULD RESULT IN LOSS OF PAYLOAD RECOVERY CAPABILITY WHICH COULD RESULT IN LOSS OF MISSION. (UNLIKE-REDUNDANCY FOR OBTAINING TARGET ANGLES EXISTS VIA THE STAR TRACKER AND COAS.) THE DMA CONTAINS ANT GIMBAL MOTORS ANT POINTING SENSORS. ERRATIC OPERATION WOULD CAUSE LOSS OF DMA OUTPUT AND ANT TRACKING. WOULD CAUSE LOSS OF RR CAP AND POSSIBLE LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS  
NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/06/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/2  
MDAC ID: 7036 ABORT: 3/3

ITEM: KU-BAND POWER SWITCH (REF KU-BAND COMM)  
FAILURE MODE: FAILS TO CLOSE

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) KU-BAND A COMM/RADAR
- 4) RENDEZVOUS RADAR
- 5) KU-BAND POWER SWITCH
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: S12

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

THE RENDEZVOUS RADAR SECTION OF THE KU-BAND COMM/RADAR SYSTEM OPERATES IN A SINGLE STRING CONFIGURATION TO SEARCH, ACQUIRE, AND TRACK DETACHED PAYLOADS WITHIN 12 NM OF THE ORBITER. THE RADAR PROVIDES TARGET DATA CONSISTING OF RANGE, RANGE RATE, ANGLE AND ANGLE RATE DURING RENDEZVOUS MANEUVERS. LOSS OF ALL CAPABILITY FOR DETERMINING THIS INFORMATION COULD RESULT IN LOSS OF PAYLOAD RECOVERY CAPABILITY WHICH COULD RESULT IN LOSS OF MISSION. (UNLIKE-REDUNDANCY FOR OBTAINING TARGET ANGLES EXISTS VIA THE STAR TRACKER AND COAS.) THE KU-BAND POWER SWITCH SELECTS ON/STBY/OFF PWR TO THE KU-BAND SYSTEM. FAILURE TO CLOSE WOULD RESULT IN LOSS OF RENDEZVOUS RADAR DATA.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

C-479

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/28/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/2  
MDAC ID: 7037 ABORT: 3/3

ITEM: KU-BAND POWER SWITCH (REF KU-BAND COMM)  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) KU-BAND A COMM/RADAR
- 4) RENDEZVOUS RADAR
- 5) KU-BAND POWER SWITCH
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: S12

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

THE RENDEZVOUS RADAR SECTION OF THE KU-BAND COMM/RADAR SYSTEM OPERATES IN A SINGLE STRING CONFIGURATION TO SEARCH, ACQUIRE, AND TRACK DETACHED PAYLOADS WITHIN 12 NM OF THE ORBITER. THE RADAR PROVIDES TARGET DATA CONSISTING OF RANGE, RANGE RATE, ANGLE AND ANGLE RATE DURING RENDEZVOUS MANEUVERS. LOSS OF ALL CAPABILITY FOR DETERMINING THIS INFORMATION COULD RESULT IN LOSS OF PAYLOAD RECOVERY CAPABILITY WHICH COULD RESULT IN LOSS OF MISSION. (UNLIKE-REDUNDANCY FOR OBTAINING TARGET ANGLES EXISTS VIA THE STAR TRACKER AND COAS.) THE KU-BAND POWER SWITCH SELECTS ON/STBY/OFF PWR TO THE KU-BAND SYSTEM. OPEN/SHORT SW WOULD RESULT IN LOSS OF RENDEZVOUS RADAR CAPABILITY.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

C-480



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/06/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/2  
MDAC ID: 7038 ABORT: 3/3

ITEM: KU-BAND POWER SWITCH (REF KU-BAND COMM)  
FAILURE MODE: FAILS TO REMAIN CLOSED

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) KU-BAND COMM/RADAR
- 4) RENDEZVOUS RADAR
- 5) KU-BAND POWER SWITCH
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: S12

CAUSES: MECHANICAL SHOCK, VIBRATION,

EFFECTS/RATIONALE:

THE RENDEZVOUS RADAR SECTION OF THE KU-BAND COMM/RADAR SYSTEM OPERATES IN A SINGLE STRING CONFIGURATION TO SEARCH, ACQUIRE, AND TRACK DETACHED PAYLOADS WITHIN 12 NM OF THE ORBITER. THE RADAR PROVIDES TARGET DATA CONSISTING OF RANGE, RANGE RATE, ANGLE AND ANGLE RATE DURING RENDEZVOUS MANEUVERS. LOSS OF ALL CAPABILITY FOR DETERMINING THIS INFORMATION COULD RESULT IN LOSS OF PAYLOAD RECOVERY CAPABILITY WHICH COULD RESULT IN LOSS OF MISSION. (UNLIKE-REDUNDANCY FOR OBTAINING TARGET ANGLES EXISTS VIA THE STAR TRACKER AND COAS.) THE KU-BAND POWER SWITCH SELECTS ON/STBY/OFF POWER TO THE KU-BAND SYSTEM. FAILURE TO REMAIN CLOSED WOULD PROVIDE ERRATIC DATA RESULTING IN LOSS OF RENDEZVOUS RADAR DATA.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

C-481

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/06/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/2  
MDAC ID: 7039 ABORT: 3/3

ITEM: KU A MODE SWITCH (REF KU-BAND COMM)  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) KU-BAND COMM/RADAR
- 4) RENDEZVOUS RADAR
- 5) KU A MODE SWITCH
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: S13

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

THE RENDEZVOUS RADAR SECTION OF THE KU-BAND COMM/RADAR SYSTEM OPERATES IN A SINGLE STRING CONFIGURATION TO SEARCH, ACQUIRE, AND TRACK DETACHED PAYLOADS WITHIN 12 NM OF THE ORBITER. THE RADAR PROVIDES TARGET DATA CONSISTING OF RANGE, RANGE RATE, ANGLE AND ANGLE RATE DURING RENDEZVOUS MANEUVERS. LOSS OF ALL CAPABILITY FOR DETERMINING THIS INFORMATION COULD RESULT IN LOSS OF PAYLOAD RECOVERY CAPABILITY WHICH COULD RESULT IN LOSS OF MISSION. (UNLIKE-REDUNDANCY FOR OBTAINING TARGET ANGLES EXISTS VIA THE STAR TRACKER AND COAS.) THE KU MODE SWITCH SELECTS RDR COOP/RDR PASSIVE/COMM. FAILURE TO SELECT RADAR WOULD RESULT IN LOSS OF RENDEZVOUS RADAR DATA.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

C-482

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/2  
MDAC ID: 7040 ABORT: 3/3

ITEM: KU A MODE SWITCH (REF KU-BAND COMM)  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) KU-BAND COMM/RADAR
- 4) RENDEZVOUS RADAR
- 5) KU A MODE SWITCH
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: S13

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

THE RENDEZVOUS RADAR SECTION OF THE KU-BAND COMM/RADAR SYSTEM OPERATES IN A SINGLE STRING CONFIGURATION TO SEARCH, ACQUIRE, AND TRACK DETACHED PAYLOADS WITHIN 12 NM OF THE ORBITER. THE RADAR PROVIDES TARGET DATA CONSISTING OF RANGE, RANGE RATE, ANGLE AND ANGLE RATE DURING RENDEZVOUS MANEUVERS. LOSS OF ALL CAPABILITY FOR DETERMINING THIS INFORMATION COULD RESULT IN LOSS OF PAYLOAD RECOVERY CAPABILITY WHICH COULD RESULT IN LOSS OF MISSION. (UNLIKE-REDUNDANCY FOR OBTAINING TARGET ANGLES EXISTS VIA THE STAR TRACKER AND COAS.) THE KU MODE SWITCH SELECTS RDR COOP/RDR PASSIVE/COMM. AN OPEN/SHORT WOULD PREVENT MODE SELECTION. FAILURE TO SELECT RADAR WOULD RESULT IN LOSS OF RENDEZVOUS RADAR DATA.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

C-483

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 7041 ABORT: 3/3

ITEM: KU BD A ANT STEERING SW (REF KU BD COMM)  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) KU-BAND COMM/RADAR
- 4) RENDEZVOUS RADAR
- 5) KU BD A ANT STEERING SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: S7

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

THE RENDEZVOUS RADAR SECTION OF THE KU-BAND COMM/RADAR SYSTEM OPERATES IN A SINGLE STRING CONFIGURATION TO SEARCH, ACQUIRE, AND TRACK DETACHED PAYLOADS WITHIN 12 NM OF THE ORBITER. THE RADAR PROVIDES TARGET DATA CONSISTING OF RANGE, RANGE RATE, ANGLE AND ANGLE RATE DURING RENDEZVOUS MANEUVERS. LOSS OF ALL CAPABILITY FOR DETERMINING THIS INFORMATION COULD RESULT IN LOSS OF PAYLOAD RECOVERY CAPABILITY WHICH COULD RESULT IN LOSS OF MISSION. (UNLIKE-REDUNDANCY FOR OBTAINING TARGET ANGLES EXISTS VIA THE STAR TRACKER AND COAS, SW FUNC VIA GND CMD.) THE ANT STEERING SW SELECTS GPC/GPC DESIG/AUTO TK/MAN SLEW. FAILURE TO SW WOULD PREVENT SELECTION OF OPTIMUM ANT STEERING MODE. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

C-484

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/2  
MDAC ID: 7042 ABORT: 3/3

ITEM: RADAR OUTPUT SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) KU-BAND A COMM/RADAR
- 4) RENDEZVOUS RADAR
- 5) RADAR OUTPUT SWITCH
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: S14

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

THE RENDEZVOUS RADAR SECTION OF THE KU-BAND COMM/RADAR SYSTEM OPERATES IN A SINGLE STRING CONFIGURATION TO SEARCH, ACQUIRE, AND TRACK DETACHED PAYLOADS WITHIN 12 NM OF THE ORBITER. THE RADAR PROVIDES TARGET DATA CONSISTING OF RANGE, RANGE RATE, ANGLE AND ANGLE RATE DURING RENDEZVOUS MANEUVERS. LOSS OF ALL CAPABILITY FOR DETERMINING THIS INFORMATION COULD RESULT IN LOSS OF PAYLOAD RECOVERY CAPABILITY WHICH COULD RESULT IN LOSS OF MISSION. (UNLIKE-REDUNDANCY FOR OBTAINING TARGET ANGLES EXISTS VIA THE STAR TRACKER AND COAS.) RADAR OUTPUT SWITCH SELECTS HIGH/MED/LOW POWER MODE. FAILURE TO SELECT HIGH POWER WOULD REDUCE OPERATIONS TO SHORT RANGE ONLY. THIS COULD MAKE RENDEZVOUS IMPOSSIBLE RESULTING IN LOSS OF PRIMARY MISSION OBJECTIVE.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87 C-485

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/2  
MDAC ID: 7043 ABORT: 3/3

ITEM: RADAR OUTPUT SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) KU-BAND A COMM/RADAR
- 4) RENDEZVOUS RADAR
- 5) RADAR OUTPUT SWITCH
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: S14

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

THE RENDEZVOUS RADAR SECTION OF THE KU-BAND COMM/RADAR SYSTEM OPERATES IN A SINGLE STRING CONFIGURATION TO SEARCH, ACQUIRE, AND TRACK DETACHED PAYLOADS WITHIN 12 NM OF THE ORBITER. THE RADAR PROVIDES TARGET DATA CONSISTING OF RANGE, RANGE RATE, ANGLE AND ANGLE RATE DURING RENDEZVOUS MANEUVERS. LOSS OF ALL CAPABILITY FOR DETERMINING THIS INFORMATION COULD RESULT IN LOSS OF PAYLOAD RECOVERY CAPABILITY WHICH COULD RESULT IN LOSS OF MISSION. (UNLIKE-REDUNDANCY FOR OBTAINING TARGET ANGLES EXISTS VIA THE STAR TRACKER AND COAS.) RADAR OUTPUT SWITCH SELECTS HIGH/MED/LOW RF TRANSMIT POWER MODE. AN OPEN/SHORT WOULD CAUSE LOSS OF RADAR. THIS COULD MAKE RENDEZVOUS IMPOSSIBLE RESULTING IN LOSS OF PRIMARY MISSION OBJECTIVE.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

C-486

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/2  
MDAC ID: 7044 ABORT: 3/3

ITEM: SLEW AZIMUTH CONTROL SWITCH (REF KU-BAND COMM)  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) KU-BAND COMM/RADAR
- 4) RENDEZVOUS RADAR
- 5) SLEW AZIMUTH CONTROL SWITCH
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: S2

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

THE RENDEZVOUS RADAR SECTION OF THE KU-BAND COMM/RADAR SYSTEM OPERATES IN A SINGLE STRING CONFIGURATION TO SEARCH, ACQUIRE, AND TRACK DETACHED PAYLOADS WITHIN 12 NM OF THE ORBITER. THE RADAR PROVIDES TARGET DATA CONSISTING OF RANGE, RANGE RATE, ANGLE AND ANGLE RATE DURING RENDEZVOUS MANEUVERS. LOSS OF ALL CAPABILITY FOR DETERMINING THIS INFORMATION COULD RESULT IN LOSS OF PAYLOAD RECOVERY CAPABILITY WHICH COULD RESULT IN LOSS OF MISSION. (UNLIKE-REDUNDANCY VIA GPC AND GPC DESIGNATE AND FOR OBTAINING TARGET ANGLES VIA THE STAR TRACKER AND COAS.) THE SLEW AZIMUTH SWITCH MOVES ANTENNA LEFT OR RIGHT FOR POINTING. FAILURE OF SLEW SWITCH COULD CAUSE LOSS OF TARGET TRACKING RESULTING IN LOSS OF RENDEZVOUS CAP AND PRIMARY MISS OBJECTIVE.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/2  
MDAC ID: 7045 ABORT: 3/3

ITEM: SLEW AZIMUTH CONTROL SWITCH (REF KU-BAND COMM)  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) KU-BAND COMM/RADAR
- 4) RENDEZVOUS RADAR
- 5) SLEW AZIMUTH CONTROL SWITCH
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: S2

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

THE RENDEZVOUS RADAR SECTION OF THE KU-BAND COMM/RADAR SYSTEM OPERATES IN A SINGLE STRING CONFIGURATION TO SEARCH, ACQUIRE, AND TRACK DETACHED PAYLOADS WITHIN 12 NM OF THE ORBITER. THE RADAR PROVIDES TARGET DATA CONSISTING OF RANGE, RANGE RATE, ANGLE AND ANGLE RATE DURING RENDEZVOUS MANEUVERS. LOSS OF ALL CAPABILITY FOR DETERMINING THIS INFORMATION COULD RESULT IN LOSS OF PAYLOAD RECOVERY CAPABILITY WHICH COULD RESULT IN LOSS OF MISSION. (UNLIKE-REDUNDANCY VIA GPC AND GPC DESIGNATE AND FOR OBTAINING TARGET ANGLES VIA THE STAR TRACKER AND COAS.) THE SLEW AZ SW MOVES ANTENNA LEFT OR RIGHT FOR POINTING. AN OPEN/SHORT FAILURE COULD CAUSE LOSS OF TARGET TRACKING RESULTING IN LOSS OF RENDEZVOUS CAP AND PRIMARY MISS OBJECTIVE.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/2  
MDAC ID: 7046 ABORT: 3/3

ITEM: SLEW ELEV CONTROL SWITCH (REF KU-BAND COMM)  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) KU-BAND COMM/RADAR
- 4) RENDEZVOUS RADAR
- 5) SLEW ELEV CONTROL SWITCH
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: S3

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

THE RENDEZVOUS RADAR SECTION OF THE KU-BAND COMM/RADAR SYSTEM OPERATES IN A SINGLE STRING CONFIGURATION TO SEARCH, ACQUIRE, AND TRACK DETACHED PAYLOADS WITHIN 12 NM OF THE ORBITER. THE RADAR PROVIDES TARGET DATA CONSISTING OF RANGE, RANGE RATE, ANGLE AND ANGLE RATE DURING RENDEZVOUS MANEUVERS. LOSS OF ALL CAPABILITY FOR DETERMINING THIS INFORMATION COULD RESULT IN LOSS OF PAYLOAD RECOVERY CAPABILITY WHICH COULD RESULT IN LOSS OF MISSION. (UNLIKE-REDUNDANCY VIA GPC AND GPC DESIGNATE AND FOR OBTAINING TARGET ANGLES VIA THE STAR TRACKER AND COAS.) THE SLEW ELEV SWITCH MOVES ANTENNA UP OR DOWN FOR POINTING. FAILURE OF SLEW SWITCH COULD CAUSE LOSS OF TARGET TRACKING RESULTING IN LOSS OF RENDEZVOUS CAPABILITY AND PRIMARY MISS OBJECTIVE.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/2  
MDAC ID: 7047 ABORT: 3/3

ITEM: SLEW ELEV CONTROL SWITCH(REF KU-BAND COMM)  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) KU-BAND COMM/RADAR
- 4) RENDEZVOUS RADAR
- 5) SLEW ELEV CONTROL SWITCH
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES	
FLIGHT PHASE	HDW/FUNC	ABORT
PRELAUNCH:	3/3	RTLS: 3/3
LIFTOFF:	3/3	TAL: 3/3
ONORBIT:	2/2	AOA: 3/3
DEORBIT:	3/3	ATO: 3/3
LANDING/SAFING:	3/3	

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: S3

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

THE RENDEZVOUS RADAR SECTION OF THE KU-BAND COMM/RADAR SYSTEM OPERATES IN A SINGLE STRING CONFIGURATION TO SEARCH, ACQUIRE, AND TRACK DETACHED PAYLOADS WITHIN 12 NM OF THE ORBITER. THE RADAR PROVIDES TARGET DATA CONSISTING OF RANGE, RANGE RATE, ANGLE AND ANGLE RATE DURING RENDEZVOUS MANEUVERS. LOSS OF ALL CAPABILITY FOR DETERMINING THIS INFORMATION COULD RESULT IN LOSS OF PAYLOAD RECOVERY CAPABILITY WHICH COULD RESULT IN LOSS OF MISSION. (UNLIKE-REDUNDANCY FOR OBTAINING TARGET ANGLES EXISTS VIA THE STAR TRACKING AND COAS.) THE SLEW ELEV SWITCH MOVES ANTENNA UP OR DOWN FOR POINTING. AN OPEN/SHORT FAILURE OF SLEW SWITCH COULD CAUSE LOSS OF TARGET TRACKING RESULTING IN LOSS OF RENDEZVOUS CAPABILITY AND LOSS OF PRIMARY MISSION OBJECTIVE.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 7048 ABORT: 3/3

ITEM: SLEW RATE CONTROL SWITCH (REF KU-BAND COMM)  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) KU-BAND COMM/RADAR
- 4) RENDEZVOUS RADAR
- 5) SLEW RATE CONTROL SWITCH
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	3/3		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: S4

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

THE RENDEZVOUS RADAR SECTION OF THE KU-BAND COMM/RADAR SYSTEM OPERATES IN A SINGLE STRING CONFIGURATION TO SEARCH, ACQUIRE, AND TRACK DETACHED PAYLOADS WITHIN 12 NM OF THE ORBITER. THE RADAR PROVIDES TARGET DATA CONSISTING OF RANGE, RANGE RATE, ANGLE AND ANGLE RATE DURING RENDEZVOUS MANEUVERS. LOSS OF ALL CAPABILITY FOR DETERMINING THIS INFORMATION COULD RESULT IN LOSS OF PAYLOAD RECOVERY CAPABILITY WHICH COULD RESULT IN LOSS OF MISSION. (UNLIKE-REDUNDANCY FOR OBTAINING TARGET ANGLES EXISTS VIA THE STAR TRACKER AND COAS.) THE SLEW RATE SWITCH CONTROLS RATE OF ANTENNA SLEWING FAST OR SLOW. FAILURE TO SWITCH WOULD PREVENT SLEWING RATE CHANGES. NO CAUSE FOR LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 7049 ABORT: 3/3

ITEM: SLEW RATE CONTROL SWITCH (REF KU-BAND COMM)  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) KU-BAND COMM/RADAR
- 4) RENDEZVOUS RADAR
- 5) SLEW RATE CONTROL SWITCH
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: S4

CAUSES: MECHANICAL SHOCK, VIBRATION -

EFFECTS/RATIONALE:

THE RENDEZVOUS RADAR SECTION OF THE KU-BAND COMM/RADAR SYSTEM OPERATES IN A SINGLE STRING CONFIGURATION TO SEARCH, ACQUIRE, AND TRACK DETACHED PAYLOADS WITHIN 12 NM OF THE ORBITER. THE RADAR PROVIDES TARGET DATA CONSISTING OF RANGE, RANGE RATE, ANGLE AND ANGLE RATE DURING RENDEZVOUS MANEUVERS. LOSS OF ALL CAPABILITY FOR DETERMINING THIS INFORMATION COULD RESULT IN LOSS OF PAYLOAD RECOVERY CAPABILITY WHICH COULD RESULT IN LOSS OF MISSION. (UNLIKE-REDUNDANCY FOR OBTAINING TARGET ANGLES EXISTS VIA THE STAR TRACKER AND COAS.) THE SLEW RATE SWITCH CONTROLS RATE OF ANTENNA SLEWING FAST OR SLOW. AN OPEN/SHORT FAILURE OF SLEW SWITCH WOULD CAUSE LOSS OF ANT SLEWING/POINTING CAP RESULTING IN LOSS OF RENDEZVOUS CAP AND PRIMARY MISS OBJECTIVE.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 7050 ABORT: 3/3

ITEM: ANT SEARCH SELECT SWITCH (REF KU-BAND COMM)  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) KU-BAND COMM/RADAR
- 4) RENDEZVOUS RADAR
- 5) ANT SEARCH SELECT SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: S8

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

THE RENDEZVOUS RADAR SECTION OF THE KU-BAND COMM/RADAR SYSTEM OPERATES IN A SINGLE STRING CONFIGURATION TO SEARCH, ACQUIRE, AND TRACK DETACHED PAYLOADS WITHIN 12 NM OF THE ORBITER. THE RADAR PROVIDES TARGET DATA CONSISTING OF RANGE, RANGE RATE, ANGLE AND ANGLE RATE DURING RENDEZVOUS MANEUVERS. LOSS OF ALL CAPABILITY FOR DETERMINING THIS INFORMATION COULD RESULT IN LOSS OF PAYLOAD RECOVERY CAPABILITY WHICH COULD RESULT IN LOSS OF MISSION. (UNLIKE-REDUNDANCY VIA GPC DESIGNATE AND MANUAL SLEW CONTROLS AND FOR OBTAINING TARGET ANGLES VIA STAR TRACKER AND COAS.) THE SEARCH SW INITIATES KU-BAND ANT SEARCH WHEN IN AUTO TRACK MODE. FAILURE TO SW PREVENTS SELECTION OF AUTO SEARCH CAP. NO CAUSE FOR LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 7051 ABORT: 3/3

ITEM: ANT SEARCH SELECT SWITCH (REF KU-BAND COMM)  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) KU-BAND COMM/RADAR
- 4) RENDEZVOUS RADAR
- 5) ANT SEARCH SELECT SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A1  
PART NUMBER: S8

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

THE RENDEZVOUS RADAR SECTION OF THE KU-BAND COMM/RADAR SYSTEM OPERATES IN A SINGLE STRING CONFIGURATION TO SEARCH, ACQUIRE, AND TRACK DETACHED PAYLOADS WITHIN 12 NM OF THE ORBITER. THE RADAR PROVIDES TARGET DATA CONSISTING OF RANGE, RANGE RATE, ANGLE AND ANGLE RATE DURING RENDEZVOUS MANEUVERS. LOSS OF ALL CAPABILITY FOR DETERMINING THIS INFORMATION COULD RESULT IN LOSS OF PAYLOAD RECOVERY CAPABILITY WHICH COULD RESULT IN LOSS OF MISSION. (UNLIKE-REDUNDANCY VIA GPC DESIGNATE AND MANUAL SLEW CONTROLS AND FOR OBTAINING TARGET ANGLES VIA STAR TRACKER AND COAS.) THE SEARCH SW INITIATES KU-BAND ANT SEARCH WHEN IN AUTO TRACK MODE. AN OPEN/SHORT FAILURE PREVENTS USE OF AUTO SEARCH CAP. NO CAUSE FOR LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATIC VS70-740109, SSSH 16.1 & 16.5, OMRS NSTS 08171 FILE III, INCO/COMM/JSC-18611 BRIEF SECTION 18

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7501 ABORT: 3/1R

ITEM: CIRCUIT BREAKER, 3A (31V73A4CB58, 61 & 64)  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) TACAN
- 4) CIRCUIT BREAKER, 3A (31V73A4CB58, 61 & 64)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL L4  
PART NUMBER: 31V73A4CB58, 61 & 64.

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECHINACAL SHOCK, THERMAL STRESS.

EFFECTS/RATIONALE:

LOSS OF AC BUS 1, 2 OR 3 (115VAC 400 CYCLES) WHICH PROVIDES POWER TO TACAN 1, 2 OR 3. THE TACAN DATA IS REQUIRED TO UPDATE THE G&N STATE-VECTOR TO BRING THE ORBITER TO THE TERMINAL AREA AND THE HEADING ALIGNMENT CIRCLE/CYLINDER. THE TACANS ARE TRIPLE REDUNDANT WITH DEDICATED CONTROLS AND OPERATE SIMULTANEOUSLY TO PROVIDE SLANT RANGE AND BEARING INFORMATION DURING DEORBIT FROM 160,000 FEET ALTITUDE DOWN TO 1500 FEET ALTITUDE OR 15 NAUTICAL MILES FROM LANDING. LOSS OF ALL RANGE PLUS BEARING OR RANGE ONLY VIA LIKE AND UNLIKE REDUNDANCY COULD CAUSE LOSS OF VEHICLE AND CREW (1R).

REFERENCES: SYSTEM SCHEMATIC VS 70-740179, SSSH 9.2, OMRS NSTS 08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 1.

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7502 ABORT: 3/1R

ITEM: ISOLATION RESISTOR, (33V73A7A1R1, 2 & 3)  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) TACAN
- 4) ISOLATION RESISTOR, (33V73A7A1R1, 2 & 3)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL 07  
PART NUMBER: 33V73A7A1R1, 2 & 3

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECHANICAL SHOCK, THERMAL STRESS.

EFFECTS/RATIONALE:

PROVIDES GPC CONTROL (AND MODE SWITCH POSITION SCAN TELEMETRY  
INPUTS TO MDM'S OF4 AND LF1) FOR ASSOCIATED TACAN'S 1, 2, 3.  
LOSS OF A1R1, A1R2, A1R3 WOULD CAUSE LOSS OF GPC MODE CONTROL OF  
LRU'S 1, 2, 3, RESPECTIVELY. LOSS OF OPERATIONALLY REDUNDANT  
PANEL MODE CONTROL ON THE AFFECTED UNIT WOULD CAUSE LOSS OF THAT  
TACAN LRU. LOSS OF ANY TWO TACAN LRU'S WOULD CAUSE LOSS OF TACAN  
UPDATES TO THE NAV FILTER AND COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SYSTEM SCHEMATIC VS 70-740179, SSSH 9.2, OMRS NSTS  
08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 1.

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7503 ABORT: 3/1R

ITEM: CIRCUIT BREAKER, 5A (33V73A14CB25, A15CB24 & A16CB18)  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) MSBLS
- 4) CIRCUIT BREAKER, 5A (33V73A14CB25, A15CB24 & A16CB18)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL 14, 15 & 16  
PART NUMBER: 33V73A14CB25, A15CB24 & A16CB18

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION, MECHANICAL SHOCK, THERMAL STRESS.

EFFECTS/RATIONALE:

LOSS OF 28VDC MAIN BUS A, B OR C WHICH PROVIDES POWER TO MSBLS 1, 2 OR 3. THE MSBLS ARE TRIPLE REDUNDANT WITH DEDICATED CONTROLS AND OPERATE SIMULTANEOUSLY TO PROVIDE AZIMUTH, ELEVATION ANGLES AND SLANT RANGE DATA TO ORBITER G&N FOR DETERMINING VEHICLE POSITION WITH REGARDS TO SELECTED RUNWAY FROM 20 NAUTICAL MILES THROUGH LANDING. MSBLS DATA IS REQUIRED TO UPDATE THE G&N STATE-VECTOR TO EFFECT A SAFE, DAMAGE FREE LANDING. DATA GENERATED BY MSBLS IS CONSIDERED A BACKUP TO THE RADAR ALTIMETER FOR PRECISE ALTITUDE/SINK-RATE INFORMATION. LOSS OF ALL CAPABILITY FOR DETERMINING PARAMETERS COULD CAUSE LOSS OF VEHICLE/CREW (1R).

REFERENCES: SYSTEM SCHEMATIC VS 70-740569, SSSH 9.4, OMRS NSTS 08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 2.

REPORT DATE 12/31/87 C-497

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 7504 ABORT: 3/1R

ITEM: ISOLATION RESISTOR, (33V73A8A5R1, A6R1 & A7R1)  
FAILURE MODE: FAILS SHORT-TO-GROUND BETWEEN THE RESISTOR AND  
MSBLS POWER SWITCH.

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) MSBLS
- 4) ISOLATION RESISTOR, (33V73A8A5R1, A6R1 & A7R1)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL 8  
PART NUMBER: 33V73A8A5R1, A6R1 & A7R1

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECHANICAL SHOCK, THERMAL STRESS.

EFFECTS/RATIONALE:

LOSS OF 28VDC ESS BUS 1BC, 2CA OR 3AB WHICH PROVIDES CONTROL  
POWER TO THE SWITCHES THAT ARE ESSENTIAL TO RESTORE POWER TO A  
FAILED MAIN OR AC BUS AND TO ESSENTIAL NON-EPS ELECTRICAL LOADS  
AND SWITCHES. SOME OF THE SELECTED CREW SWITCHES AND LOADS THAT  
COULD BE WITHOUT POWER ARE EPS SYSTEM SWITCHES, GPC SWITCHES,  
TACAN MODE SWITCHES, RADAR ALTIMETER AND MSBLS POWER SWITCHES,  
C&W SYSTEM, EMERGENCY LIGHTING, AUDIO CONTROL PANEL AND MASTER  
TIMING UNIT. ESSENTIAL BUSES ARE ALSO USED FOR SWITCHING  
DISCRETES TO MDMS. LOSS OF THESE SYSTEMS COULD CAUSE LOSS OF  
VEHICLE/CREW (1R). NOTE: THESE RESISTORS ARE ON LOAD SIDE OF  
ASSOCIATED SWITCHES INSTEAD OF BUS SIDE, SO BUSES ARE NOT  
PROTECTED AGAINST SWITCH SHORTS TO GROUND.

REFERENCES: SYSTEM SCHEMATIC VS 70-740569, SSSH 9.4, OMRS NSTS  
08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 2.

REPORT DATE 12/31/87 C-498

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 7505 ABORT: 3/3

ITEM: ISOLATION RESISTOR 33V73A8A5R1, A6R1, A7R1  
FAILURE MODE: OPEN (ELECTRICAL)

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A. W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) MSBLS
- 4) ISOLATION RESISTOR
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL 08  
PART NUMBER: 33V73A8A5R1, A6R1, A7R1

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE

EFFECTS/RATIONALE:

LOSS OF SWITCH SCAN TELEMETRY INPUTS TO MDM'S LF1, OF4 FOR POSITION OF POWER SWITCHES S8, S9, S10, RESPECTIVELY, WHICH PROVIDE POWER TO MSBLS DECODER 1, 2, 3, RESPECTIVELY. FAILURE WOULD NOT AFFECT MISSION OR ENDANGER CREW/VEHICLE.

REFERENCES: SYSTEM SCHEMATIC VS 70-740569, SSSH 9.4, OMRS NSTS 08171 FILE III, GNC SYSTEM BRIEF JSC 18863 SECTION 2.

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/23/87  
SUBSYSTEM: COMM AND TRACK  
MDAC ID: 7506

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: CIRCUIT BREAKER, 3A(33V73A14CB24 & A15CB23)  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: H.J. LOWERY

SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) NAVAIDS
- 3) RADAR ALTIMETER
- 4) CIRCUIT BREAKER, 3A(33V73A14CB24 & A15CB23)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/1R	
LIFTOFF:	3/3	TAL:	3/1R	
ONORBIT:	3/3	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	3/1R	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL 14 & 15  
PART NUMBER: 33V73A14CB24 & A15CB23

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECHANICAL SHOCK, THERMAL STRESS.

EFFECTS/RATIONALE:

LOSS OF 28VDC MAIN BUS A OR B WHICH PROVIDES POWER TO THE RADAR ALTIMETER. THE RADAR ALTIMETER IS DUAL REDUNDANT WITH DEDICATED CONTROLS AND PROVIDES PRECISION ALTITUDE DATA TO DRIVE CREW DISPLAYS FROM AN ALTITUDE OF 5000 FEET TO TOUCHDOWN. THE RADAR ALTIMETER DATA IS REQUIRED FOR PRECISE ALTITUDE/SINK-RATE INFORMATION. LOSS OF ALL CAPABILITY FOR DETERMINING ALTITUDE COULD CAUSE LOSS OF VEHICLE/CREW (1R).

REFERENCES: SYSTEM SCHEMATIC VS 70-740159, SSSH 9.3, OMRS NSTS 08171 FILE III, GN&C SYSTEM BRIEF JSC 18863 SECTION 3.

REPORT DATE 12/31/87

C-500

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8001 ABORT: 3/3

ITEM: VIDEO SWITCHING UNIT  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIDEO CONTROL UNIT (VCU)
- 4) VIDEO SWITCHING UNIT (VSU)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	2/1R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ p ] C [ p ]

LOCATION: R17  
PART NUMBER: 2294823

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) THE VSU LRU PRIMARILY PROVIDES IN/OUT VIDEO SWITCHING. FAILURE WOULD CAUSE LOSS OF CCTV FUNCTIONS AND CAP TO MONITOR RMS MOTION RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-501

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8002 ABORT: 3/3

ITEM: VIDEO SWITCHING UNIT  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIDEO CONTROL UNIT (VCU)
- 4) VIDEO SWITCHING UNIT (VSU)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ p ] C [ p ]

LOCATION: R17  
PART NUMBER: 2294823

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) THE VSU LRU PRIMARILY PROVIDES IN/OUT VIDEO SWITCHING. FAILURE TO SW WOULD CAUSE LOSS OF TVC SELECTION AND CAP TO MONITOR RMS MOTION RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-502

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8003 ABORT: 3/3

ITEM: VIDEO SWITCHING UNIT  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIDEO CONTROL UNIT (VCU)
- 4) VIDEO SWITCHING UNIT (VSU)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ p ] C [ p ]

LOCATION: R17  
PART NUMBER: 2294823

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) THE VSU LRU PRIMARILY PROVIDES IN/OUT VIDEO SWITCHING. OPEN/SHORT COULD CAUSE LOSS OF TVC SELECTION AND CAP TO MONITOR RMS MOTION RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-503

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8004 ABORT: 3/3

ITEM: REMOTE CONTROL UNIT  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIDEO CONTROL UNIT (VCU)
- 4) REMOTE CONTROL UNIT (RCU)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ p ] C [ p ]

LOCATION: R18  
PART NUMBER: 2294824

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) RCU LRU PRIMARILY PROVIDES TV CAM (TVC) MASTER SYNC SIGNALS AND PROCESSES CCTV SYS CMDS. FAILURE WOULD CAUSE LOSS OF TVC SELECTION AND CAP TO MONITOR RMS MOTION RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-504



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8005 ABORT: 3/3

ITEM: REMOTE CONTROL UNIT  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIDEO CONTROL UNIT (VCU)
- 4) REMOTE CONTROL UNIT (RCU)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ p ] C [ p ]

LOCATION: R18  
PART NUMBER: 2294824

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) RCU LRU PRIMARILY PROVIDES TV CAM (TVC) MASTER SYNC SIGNALS AND PROCESSES CCTV SYS CMDS. AN OPEN/SHORT COULD CAUSE LOSS OF TVC SELECTION AND CAP TO MONITOR RMS MOTION RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-505

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8006 ABORT: 3/3

ITEM: TV CAMERA (FLT DECK)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: CABIN FLIGHT DECK  
PART NUMBER: 2294819

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND IVA CREW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) FAILURE WOULD CAUSE LOSS OF IN CABIN FLT DECK SCENES FOR TRANSMISSION TO GROUND. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-506

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8007 ABORT: 3/3

ITEM: TV CAMERA (MID DECK)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: CABIN MID DECK  
PART NUMBER: 2294819

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND IVA CREW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) FAILURE WOULD CAUSE LOSS OF IN CABIN MID DECK SCENES FOR TRANSMISSION TO GROUND. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-507

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8008 ABORT: 3/3

ITEM: TV CAMERA A (FWD P/L BAY)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: FWD PAYLOAD BAY  
PART NUMBER: 2294819

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF TV CAM (TVC) COULD CAUSE LOSS OF CCTV CAP TO MONITOR RMS MOTION RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-508

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8009 ABORT: 3/3

ITEM: TV CAMERA B (KEEL/EVA)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PAYLOAD BAY KEEL/EVA POSITION  
PART NUMBER: 2294819

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF TV CAM (TVC) COULD  
CAUSE LOSS OF CCTV CAP TO MONITOR RMS MOTION RESULTING IN  
POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-509

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8010 ABORT: 3/3

ITEM: TV CAMERA C (AFT P/L BAY)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AFT PAYLOAD BAY  
PART NUMBER: 2294819

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF TV CAM (TVC) COULD CAUSE LOSS OF CCTV CAP TO MONITOR RMS MOTION RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-510

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8011 ABORT: 3/3

ITEM: TV CAMERA D (RMS STBD POSITION FWD)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: RMS STBD POSITION FWD PAYLOAD BAY  
PART NUMBER: 2294819

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF TV CAM (TVC) COULD CAUSE LOSS OF CCTV CAP TO MONITOR RMS MOTION RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-511

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8012 ABORT: 3/3

ITEM: TV CAMERA RMS WRIST  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: RMS ARM  
PART NUMBER: 2294819

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP AND RMS ELBOW TVC TO VIEW RMS ACTIVITY.) FAILURE OF RMS WRIST TVC COULD REDUCE CAP TO VIEW RMS WORK RESULTING IN POSSIBLE LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-512



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8013 ABORT: 3/3

ITEM: TV CAMERA RMS ELBOW  
FAILURE MODE: LOST OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: RMS ARM  
PART NUMBER: 2294819

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT, ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP AND RMS WRIST TVC TO VIEW RMS ACTIVITY.) FAILURE OF RMS ELBOW TVC COULD REDUCE CAP TO VIEW RMS WORK RESULTING IN POSSIBLE LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-513

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8014 ABORT: 3/3

ITEM: PAN AND TILT UNIT (TVC A POSITION)  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) PAN AND TILT UNIT (PTU)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: FWD PAYLOAD BAY PORT POSITION (TVC A)  
PART NUMBER: 2294822

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) PTU PROVIDES TVC "A" POINTING CAPABILITY. FAILURE OF TVC "A" P/T RESULTS IN LOSS OF TARGET TRACK CAPABILITY AND EFFECTIVE CCTV COVERAGE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-514

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8015 ABORT: 3/3

ITEM: PAN AND TILT UNIT (TVC A POSITION)  
FAILURE MODE: FAILS TO START/STOP

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) PAN AND TILT UNIT (PTU)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: FWD PAYLOAD BAY PORT POSITION (TVC A)  
PART NUMBER: 2294822

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) PTU PROVIDES TVC "A" POINTING CAPABILITY. FAILURE OF TVC "A" P/T RESULTS IN LOSS OF TARGET TRACK CAPABILITY AND EFFECTIVE CCTV COVERAGE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-515

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8016 ABORT: 3/3

ITEM: PAN AND TILT UNIT (TVC A POSITION)  
FAILURE MODE: ERRATIC/INTERMITTENT OPERATION

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) PAN AND TILT UNIT (PTU)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: FWD PAYLOAD BAY PORT POSITION (TVC A)  
PART NUMBER: 2294822

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) PTU PROVIDES TVC "A" POINTING  
CAPABILITY. FAILURE OF TVC "A" P/T RESULTS IN LOSS OF TARGET  
TRACK CAPABILITY AND EFFECTIVE CCTV COVERAGE RESULTING IN  
POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-516

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8017 ABORT: 3/3

ITEM: PAN AND TILT UNIT (TVC B POSITION)  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) PAN AND TILT UNIT (PTU)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	2/1R		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AFT PAYLOAD BAY KEEL/EVA (TVC B POSITION)  
PART NUMBER: 2294822

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) PTU PROVIDES TVC "B" POINTING  
CAPABILITY. FAILURE OF TVC "B" P/T RESULTS IN LOSS OF TARGET  
TRACK CAPABILITY AND EFFECTIVE CCTV COVERAGE OF RMS MOTION  
RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-517

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8018 ABORT: 3/3

ITEM: PAN AND TILT UNIT (TVC B POSITION)  
FAILURE MODE: FAILS TO START/STOP

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) PAN AND TILT UNIT (PTU)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AFT PAYLOAD BAY KEEL/EVA (TVC B POSITION)  
PART NUMBER: 2294822

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) PTU PROVIDES TVC "B" POINTING  
CAPABILITY. FAILURE OF TVC "B" P/T RESULTS IN LOSS OF TARGET  
TRACK CAPABILITY AND EFFECTIVE CCTV COVERAGE RESULTING IN  
POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-518

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8019 ABORT: 3/3

ITEM: PAN AND TILT UNIT (TVC B POSITION)  
FAILURE MODE: ERRATIC/INTERMITTENT OPERATION

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) PAN AND TILT UNIT (PTU)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	2/1R		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AFT PAYLOAD BAY KEEL/EVA (TVC B POSITION)  
PART NUMBER: 2294822

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) PTU PROVIDES TVC "B" POINTING CAPABILITY. FAILURE OF TVC "B" P/T RESULTS IN LOSS OF TARGET TRACK CAPABILITY AND EFFECTIVE CCTV COVERAGE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-519

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8020 ABORT: 3/3

ITEM: PAN AND TILT UNIT (TVC C POSITION)  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) PAN AND TILT UNIT (PTU)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AFT PAYLOAD BAY TVC C POSITION  
PART NUMBER: 2294822

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) PTU PROVIDES TVC "C" POINTING CAPABILITY. FAILURE OF TVC "C" P/T RESULTS IN LOSS OF TARGET TRACK CAPABILITY AND EFFECTIVE CCTV COVERAGE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-520



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8021 ABORT: 3/3

ITEM: PAN AND TILT UNIT (TVC C POSITION)  
FAILURE MODE: FAILS TO START STOP

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) PAN AND TILT UNIT (PTU)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AFT PAYLOAD BAY TVC C POSITION  
PART NUMBER: 2294822

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) PTU PROVIDES TVC "C" POINTING CAPABILITY. FAILURE OF TVC "C" P/T RESULTS IN LOSS OF TARGET TRACK CAPABILITY AND EFFECTIVE CCTV COVERAGE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-521

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8022 ABORT: 3/3

ITEM: PAN AND TILT UNIT (TVC C POSITION)  
FAILURE MODE: ERRATIC/INTERMITTENT OPERATION

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) PAN AND TILT UNIT (PTU)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/2R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AFT PAYLOAD BAY TVC C POSITION  
PART NUMBER: 2294822

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) PTU PROVIDES TVC "C" POINTING CAPABILITY. FAILURE OF TVC "C" P/T RESULTS IN LOSS OF TARGET TRACK CAPABILITY AND EFFECTIVE CCTV COVERAGE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-522

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8023 ABORT: 3/3

ITEM: PAN AND TILT UNIT (TVC D POSITION)  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) PAN AND TILT UNIT (PTU)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	3/2R		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: FWD P/L BAY STBD RMS TVC D POSITION  
PART NUMBER: 2294822

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) PTU PROVIDES TVC "D" POINTING  
CAPABILITY. FAILURE OF TVC "D" P/T RESULTS IN LOSS OF TARGET  
TRACK CAPABILITY AND EFFECTIVE CCTV COVERAGE RESULTING IN  
POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-523

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8024 ABORT: 3/3

ITEM: PAN AND TILT UNIT (TVC D POSITION)  
FAILURE MODE: FAILS TO START/STOP

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) PAN AND TILT UNIT (PTU)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: FWD P/L BAY STBD RMS TVC D POSITION  
PART NUMBER: 2294822

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) PTU PROVIDES TVC "D" POINTING CAPABILITY. FAILURE OF TVC "D" P/T RESULTS IN LOSS OF TARGET TRACK CAPABILITY AND EFFECTIVE CCTV COVERAGE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-524

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8025 ABORT: 3/3

ITEM: PAN AND TILT UNIT (TVC D POSITION)  
FAILURE MODE: ERRATIC/INTERMITTENT OPERATION

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) PAN AND TILT UNIT (PTU)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ p ]

LOCATION: FWD P/L BAY STBD RMS TVC D POSITION  
PART NUMBER: 2294822

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) PTU PROVIDES TVC "D" POINTING  
CAPABILITY. FAILURE OF TVC "D" P/T RESULTS IN LOSS OF TARGET  
TRACK CAPABILITY AND EFFECTIVE CCTV COVERAGE RESULTING IN  
POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-525

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8026 ABORT: 3/3

ITEM: PAN AND TILT UNIT (RMS ELBOW TVC POSITION)  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) PAN AND TILT UNIT (PTU)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: RMS ARM  
PART NUMBER: 2294822

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP AND RMS WRIST TVC TO VIEW RMS ACTIVITY.) PTU PROVIDES RMS ELBOW TVC POINTING CAPABILITY. FAILURE OF P/T RESULTS IN LOSS OF TARGET TRACK CAPABILITY AND EFFECTIVE CCTV COVERAGE RESULTING IN POSSIBLE LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-526

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8027 ABORT: 3/3

ITEM: PAN AND TILT UNIT (RMS ELBOW TVC POSITION)  
FAILURE MODE: FAILS TO START/STOP

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) PAN AND TILT UNIT (PTU)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ p ]

LOCATION: RMS ARM  
PART NUMBER: 2294822

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP AND RMS WRIST TVC TO VIEW RMS ACTIVITY.) PTU PROVIDES RMS ELBOW TVC POINTING CAPABILITY. FAILURE OF P/T RESULTS IN LOSS OF TARGET TRACK CAPABILITY AND EFFECTIVE CCTV COVERAGE RESULTING IN POSSIBLE LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-527

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8028 ABORT: 3/3

ITEM: PAN AND TILT UNIT (RMS ELBOW TVC POSITION)  
FAILURE MODE: ERRATIC/INTERMITTENT OPERATION

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) PAN AND TILT UNIT (PTU)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: RMS ARM  
PART NUMBER: 2294822

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP AND RMS WRIST TVC TO VIEW RMS ACTIVITY.) PTU PROVIDES RMS ELBOW TVC POINTING CAPABILITY. FAILURE OF P/T RESULTS IN LOSS OF TARGET TRACK CAPABILITY AND EFFECTIVE CCTV COVERAGE RESULTING IN POSSIBLE LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8029 ABORT: 3/3

ITEM: MONOCHROME LENS ASSEMBLY (FLT DECK TVC)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) MONOCHROME LENS ASSEMBLY (MLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	3/3		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: CABIN FLT DECK  
PART NUMBER: 2294820

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF MLA WOULD CAUSE LOSS  
OF TV CAMERA IRIS, ZOOM AND FOCUS CONTROL RESULTING IN LOSS OF  
EFFECTIVE CCTV CABIN FLT DECK COVERAGE. NO CAUSE FOR LOSS OF  
MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-529

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8030 ABORT: 3/3

ITEM: MONOCHROME LENS ASSEMBLY (FLT DECK TVC)  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) MONOCHROME LENS ASSEMBLY (MLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: CABIN FLT DECK  
PART NUMBER: 2294820

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF MLA WOULD CAUSE LOSS  
OF TV CAMERA IRIS, ZOOM AND FOCUS CONTROL RESULTING IN LOSS OF  
EFFECTIVE CCTV CABIN FLT DECK COVERAGE. NO CAUSE FOR LOSS OF  
MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-530

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8031 ABORT: 3/3

ITEM: MONOCHROME LENS ASSEMBLY (MID DECK TVC)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) MONOCHROME LENS ASSEMBLY (MLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: CABIN MID DECK  
PART NUMBER: 2294820

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF MLA WOULD CAUSE LOSS OF TV CAMERA IRIS, ZOOM AND FOCUS CONTROL RESULTING IN LOSS OF EFFECTIVE CCTV CABIN MID DECK COVERAGE. NO CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-531

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8032 ABORT: 3/3

ITEM: MONOCHROME LENS ASSEMBLY (MID DECK TVC)  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) MONOCHROME LENS ASSEMBLY (MLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: CABIN MID DECK  
PART NUMBER: 2294820

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF MLA WOULD CAUSE LOSS  
OF TV CAMERA IRIS, ZOOM AND FOCUS CONTROL RESULTING IN LOSS OF  
EFFECTIVE CCTV CABIN MID DECK COVERAGE. NO CAUSE FOR LOSS OF  
MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-532

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8033 ABORT: 3/3

ITEM: MONOCHROME LENS ASSEMBLY (TVC A FWD P/L BAY)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) MONOCHROME LENS ASSEMBLY (MLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PAYLOAD BAY TVC A  
PART NUMBER: 2294820

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF MLA WOULD CAUSE LOSS  
OF TV CAMERA IRIS, ZOOM AND FOCUS CONTROL RESULTING IN LOSS OF  
EFFECTIVE CCTV COVERAGE AND POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-533

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8034 ABORT: 3/3

ITEM: MONOCHROME LENS ASSEMBLY (TVC A FWD P/L BAY)  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) MONOCHROME LENS ASSEMBLY (MLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PAYLOAD BAY TVC A  
PART NUMBER: 2294820

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF MLA WOULD CAUSE LOSS  
OF TV CAMERA IRIS, ZOOM AND FOCUS CONTROL RESULTING IN LOSS OF  
EFFECTIVE CCTV COVERAGE AND POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-534

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8035 ABORT: 3/3

ITEM: MONOCHROME LENS ASSEMBLY (TVC B KEEL/EVA AFT P/L BAY)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) MONOCHROME LENS ASSEMBLY (MLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AFT P/L BAY TVC B  
PART NUMBER: 2294820

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF MLA WOULD CAUSE LOSS OF TV CAMERA IRIS, ZOOM AND FOCUS CONTROL RESULTING IN LOSS OF EFFECTIVE CCTV COVERAGE AND POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-535

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8036 ABORT: 3/3

ITEM: MONOCHROME LENS ASSEMBLY (TVC B KEEL/EVA AFT P/L BAY)  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) MONOCHROME LENS ASSEMBLY (MLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AFT P/L BAY TVC B  
PART NUMBER: 2294820

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF MLA WOULD CAUSE LOSS OF TV CAMERA IRIS, ZOOM AND FOCUS CONTROL RESULTING IN LOSS OF EFFECTIVE CCTV COVERAGE AND POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8037 ABORT: 3/3

ITEM: MONOCHROME LENS ASSEMBLY (TVC C AFT P/L BAY)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) MONOCHROME LENS ASSEMBLY (MLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC C AFT P/L BAY  
PART NUMBER: 2294820

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF MLA WOULD CAUSE LOSS OF TV CAMERA IRIS, ZOOM AND FOCUS CONTROL RESULTING IN LOSS OF EFFECTIVE CCTV COVERAGE AND POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-537

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8038 ABORT: 3/3

ITEM: MONOCHROME LENS ASSEMBLY (TVC C AFT P/L BAY)  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) MONOCHROME LENS ASSEMBLY (MLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC C AFT P/L BAY  
PART NUMBER: 2294820

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF MLA WOULD CAUSE LOSS OF TV CAMERA IRIS, ZOOM AND FOCUS CONTROL RESULTING IN LOSS OF EFFECTIVE CCTV COVERAGE AND POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-538

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8039 ABORT: 3/3

ITEM: MONOCHROME LENS ASSEMBLY (TVC D FWD P/L BAY)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) MONOCHROME LENS ASSEMBLY (MLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC D FWD P/L BAY  
PART NUMBER: 2294820

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF MLA WOULD CAUSE LOSS OF TV CAMERA IRIS, ZOOM AND FOCUS CONTROL RESULTING IN LOSS OF EFFECTIVE CCTV COVERAGE AND POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-539

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8040 ABORT: 3/3

ITEM: MONOCHROME LENS ASSEMBLY (TVC D FWD P/L BAY)  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) MONOCHROME LENS ASSEMBLY (MLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC D FWD P/L BAY  
PART NUMBER: 2294820

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF MLA WOULD CAUSE LOSS OF TV CAMERA IRIS, ZOOM AND FOCUS CONTROL RESULTING IN LOSS OF EFFECTIVE CCTV COVERAGE AND POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-540

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8041 ABORT: 3/3

ITEM: MONOCHROME LENS ASSEMBLY (P/L BAY RMS WRIST TVC)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) MONOCHROME LENS ASSEMBLY (MLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: P/L BAY RMS WRIST TVC  
PART NUMBER: 2294820

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP AND ELBOW TVC FOR VEIHING RMS ACTIVITY.) FAILURE OF MLA WOULD CAUSE LOSS OF TV CAMERA IRIS, ZOOM AND FOCUS CONTROL RESULTING IN LOSS OF EFFECTIVE CCTV COVERAGE AND POSSIBLE LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-541

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8042 ABORT: 3/3

ITEM: MONOCHROME LENS ASSEMBLY (P/L BAY RMS WRIST TVC)  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) MONOCHROME LENS ASSEMBLY (MLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: P/L BAY RMS WRIST TVC  
PART NUMBER: 2294820

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP AND ELBOW TVC FOR VEIIVING RMS ACTIVITY.) FAILURE OF MLA WOULD CAUSE LOSS OF TV CAMERA IRIS, ZOOM AND FOCUS CONTROL RESULTING IN LOSS OF EFFECTIVE CCTV COVERAGE AND POSSIBLE LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-542

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8043 ABORT: 3/3

ITEM: MONOCHROME LENS ASSEMBLY (P/L BAY RMS ELBOW TVC)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) MONOCHROME LENS ASSEMBLY (MLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: P/L BAY RMS ELBOW TVC  
PART NUMBER: 2294820

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP AND WRIST TVC FOR VIEWING RMS  
ACTIVITY.) FAILURE OF MLA WOULD CAUSE LOSS OF TV CAMERA IRIS,  
ZOOM AND FOCUS CONTROL RESULTING IN LOSS OF EFFECTIVE CCTV  
COVERAGE AND POSSIBLE LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-543

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8044 ABORT: 3/3

ITEM: MONOCHROME LENS ASSEMBLY (P/L BAY RMS ELBOW TVC)  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) MONOCHROME LENS ASSEMBLY (MLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: P/L BAY RMS ELBOW TVC  
PART NUMBER: 2294820

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP AND WRIST TVC FOR VIEWING RMS ACTIVITY.) FAILURE OF MLA WOULD CAUSE LOSS OF TV CAMERA IRIS, ZOOM AND FOCUS CONTROL RESULTING IN LOSS OF EFFECTIVE CCTV COVERAGE AND POSSIBLE LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: . 8045 ABORT: 3/3

ITEM: WIDE ANGLE LENS ASSEMBLY (FLT DECK TVC)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) WIDE ANGLE LENS ASSEMBLY (WLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: CABIN FLT DECK TVC  
PART NUMBER: 2307088

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) WLS ONLY USED IN CABIN. LOSS WOULD NOT BE BASIS FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8046 ABORT: 3/3

ITEM: WIDE ANGLE LENS ASSEMBLY (FLT DECK TVC)  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) WIDE ANGLE LENS ASSEMBLY (WLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: CABIN FLT DECK TVC  
PART NUMBER: 2307088

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) WLS ONLY USED IN CABIN. LOSS WOULD NOT BE BASIS FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8047 ABORT: 3/3

ITEM: WIDE ANGLE LENS ASSEMBLY (MID DECK TVC)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) WIDE ANGLE LENS ASSEMBLY (WLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: CABIN MID DECK TVC  
PART NUMBER: 2307088

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) WLS ONLY USED IN CABIN. LOSS  
WOULD NOT BE BASIS FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-547

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8048 ABORT: 3/3

ITEM: WIDE ANGLE LENS ASSEMBLY (MID DECK TVC)  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) WIDE ANGLE LENS ASSEMBLY (WLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: CABIN MID DECK TVC  
PART NUMBER: 2307088

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) WLS ONLY USED IN CABIN. LOSS WOULD NOT BE BASIS FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8049 ABORT: 3/3

ITEM: COLOR LENS ASSEMBLY (FLT DECK TVC)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) COLOR LENS ASSEMBLY (CLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: CABIN FLT DECK TVC  
PART NUMBER: 2294821

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF CLA WOULD CAUSE LOSS  
OF TV CAMERA IRIS, ZOOM, FOCUS, AND COLOR CONTROL RESULTING IN  
LOSS OF EFFECTIVE CCTV COVERAGE OF CABIN. NOT CAUSE FOR LOSS OF  
MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8050 ABORT: 3/3

ITEM: COLOR LENS ASSEMBLY (FLT DECK TVC)  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) COLOR LENS ASSEMBLY (CLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: CABIN FLT DECK TVC  
PART NUMBER: 2294821

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF CLA WOULD CAUSE LOSS  
OF TV CAMERA IRIS, ZOOM, FOCUS, AND COLOR CONTROL RESULTING IN  
LOSS OF EFFECTIVE CCTV COVERAGE OF CABIN. NOT CAUSE FOR LOSS OF  
MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8051 ABORT: 3/3

ITEM: COLOR LENS ASSEMBLY (MID DECK TVC)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) COLOR LENS ASSEMBLY (CLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: CABIN MID DECK TVC  
PART NUMBER: 2294821

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF CLA WOULD CAUSE LOSS OF TV CAMERA IRIS, ZOOM, FOCUS, AND COLOR CONTROL RESULTING IN LOSS OF EFFECTIVE CCTV COVERAGE OF CABIN. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-551

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8052 ABORT: 3/3

ITEM: COLOR LENS ASSEMBLY (MID DECK TVC)  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) COLOR LENS ASSEMBLY (CLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: CABIN MID DECK TVC  
PART NUMBER: 2294821

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF CLA WOULD CAUSE LOSS  
OF TV CAMERA IRIS, ZOOM, FOCUS, AND COLOR CONTROL RESULTING IN  
LOSS OF EFFECTIVE CCTV COVERAGE OF CABIN. NOT CAUSE FOR LOSS OF  
MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-552



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8053 ABORT: 3/3

ITEM: COLOR LENS ASSEMBLY (TVC A)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) COLOR LENS ASSEMBLY (CLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: FWD P/L BAY TVC A  
PART NUMBER: 2294821

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF CLA WOULD CAUSE LOSS OF TV CAMERA IRIS, ZOOM, FOCUS, AND COLOR CONTROL RESULTING IN LOSS OF EFFECTIVE CCTV COVERAGE AND POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-553

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8054 ABORT: 3/3

ITEM: COLOR LENS ASSEMBLY (TVC A)  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) COLOR LENS ASSEMBLY (CLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: FWD P/L BAY TVC A  
PART NUMBER: 2294821

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF CLA WOULD CAUSE LOSS OF TV CAMERA IRIS, ZOOM, FOCUS, AND COLOR CONTROL RESULTING IN LOSS OF EFFECTIVE CCTV COVERAGE AND POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-554

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8055 ABORT: 3/3

ITEM: COLOR LENS ASSEMBLY (TVC B)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) COLOR LENS ASSEMBLY (CLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AFT P/L BAY TVC B  
PART NUMBER: 2294821

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF CLA WOULD CAUSE LOSS OF TV CAMERA IRIS, ZOOM, FOCUS, AND COLOR CONTROL RESULTING IN LOSS OF EFFECTIVE CCTV COVERAGE AND POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-555

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8056 ABORT: 3/3

ITEM: COLOR LENS ASSEMBLY (TVC B)  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) COLOR LENS ASSEMBLY (CLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AFT P/L BAY TVC B  
PART NUMBER: 2294821

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF CLA WOULD CAUSE LOSS  
OF TV CAMERA IRIS, ZOOM, FOCUS, AND COLOR CONTROL RESULTING IN  
LOSS OF EFFECTIVE CCTV COVERAGE AND POSSIBLE LOSS OF VEHICLE AND  
CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-556

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8057 ABORT: 3/3

ITEM: COLOR LENS ASSEMBLY (TVC C)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) COLOR LENS ASSEMBLY (CLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	2/1R		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AFT P/L BAY TVC C  
PART NUMBER: 2294821

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF CLA WOULD CAUSE LOSS  
OF TV CAMERA IRIS, ZOOM, FOCUS, AND COLOR CONTROL RESULTING IN  
LOSS OF EFFECTIVE CCTV COVERAGE AND POSSIBLE LOSS OF VEHICLE AND  
CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-557

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8058 ABORT: 3/3

ITEM: COLOR LENS ASSEMBLY (TVC C)  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) COLOR LENS ASSEMBLY (CLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AFT P/L BAY TVC C  
PART NUMBER: 2294821

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF CLA WOULD CAUSE LOSS  
OF TV CAMERA IRIS, ZOOM, FOCUS, AND COLOR CONTROL RESULTING IN  
LOSS OF EFFECTIVE CCTV COVERAGE AND POSSIBLE LOSS OF VEHICLE AND  
CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-558

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8059 ABORT: 3/3

ITEM: COLOR LENS ASSEMBLY (TVC D)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) COLOR LENS ASSEMBLY (CLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: FWD P/L BAY TVC D  
PART NUMBER: 2294821

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF CLA WOULD CAUSE LOSS  
OF TV CAMERA IRIS, ZOOM, FOCUS, AND COLOR CONTROL RESULTING IN  
LOSS OF EFFECTIVE CCTV COVERAGE AND POSSIBLE LOSS OF VEHICLE AND  
CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-559

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8060 ABORT: 3/3

ITEM: COLOR LENS ASSEMBLY (TVC D)  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) COLOR LENS ASSEMBLY (CLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: FWD P/L BAY TVC D  
PART NUMBER: 2294821

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) FAILURE OF CLA WOULD CAUSE LOSS  
OF TV CAMERA IRIS, ZOOM, FOCUS, AND COLOR CONTROL RESULTING IN  
LOSS OF EFFECTIVE CCTV COVERAGE AND POSSIBLE LOSS OF VEHICLE AND  
CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-560



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8061 ABORT: 3/3

ITEM: COLOR LENS ASSEMBLY (RMS WRIST TVC)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) COLOR LENS ASSEMBLY (CLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	3/2R		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: P/L BAY RMS WRIST TVC  
PART NUMBER: 2294821

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP AND ELBOW TVC FOR VIEWING RMS ACTIVITY.) FAILURE OF CLA WOULD CAUSE LOSS OF TV CAMERA IRIS, ZOOM, FOCUS, AND COLOR CONTROL RESULTING IN LOSS OF EFFECTIVE CCTV COVERAGE AND POSSIBLE LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-561

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8062 ABORT: 3/3

ITEM: COLOR LENS ASSEMBLY (RMS WRIST TVC)  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) COLOR LENS ASSEMBLY (CLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: P/L BAY RMS WRIST TVC  
PART NUMBER: 2294821

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE: CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP AND ELBOW TVC FOR VIEWING RMS ACTIVITY.) FAILURE OF CLA WOULD CAUSE LOSS OF TV CAMERA IRIS, ZOOM, FOCUS, AND COLOR CONTROL RESULTING IN LOSS OF EFFECTIVE CCTV COVERAGE AND POSSIBLE LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-562

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8063 ABORT: 3/3

ITEM: COLOR LENS ASSEMBLY (RMS ELBOW TVC)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) COLOR LENS ASSEMBLY (CLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: P/L BAY RMS ELBOW TVC  
PART NUMBER: 2294821

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP AND WRIST TVC FOR VIEWING RMS ACTIVITY.) FAILURE OF CLA WOULD CAUSE LOSS OF TV CAMERA IRIS, ZOOM, FOCUS, AND COLOR CONTROL RESULTING IN LOSS OF EFFECTIVE CCTV COVERAGE AND POSSIBLE LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-563

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8064 ABORT: 3/3

ITEM: COLOR LENS ASSEMBLY (RMS ELBOW TVC)  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) COLOR LENS ASSEMBLY (CLA)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: P/L BAY RMS ELBOW TVC  
PART NUMBER: 2294821

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP AND WRIST TVC FOR VIEWING RMS ACTIVITY.) FAILURE OF CLA WOULD CAUSE LOSS OF TV CAMERA IRIS, ZOOM, FOCUS, AND COLOR CONTROL RESULTING IN LOSS OF EFFECTIVE CCTV COVERAGE AND POSSIBLE LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-564

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8065 ABORT: 3/3

ITEM: FLT DECK VIEWFINDER MONITOR  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIEWFINDER MONITOR
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	3/3		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK  
PART NUMBER: 2294825

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. THE VIEWFINDER MONITOR USED WITH FLT DECK  
TV CAMERAS FOR SETUP AND ADJUSTMENTS. FAILURE WOULD MAKE  
ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN LOST OF FLT  
DECK AND OUT THE WINDOW SCENES. LOSS OF LIKE AND UNLIKE REDUND.  
WOULD NOT CAUSE LOSS OF MISSION. (LIKE REDUND, MID DECK  
VIEWFINDER, AND UNLIKE VIA TWO CONSOLE MONITORS IN AFT CABIN AND  
MONITORS ON THE GROUND.)

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-565

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8066 ABORT: 3/3

ITEM: MID DECK VIEWFINDER MONITOR  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIEWFINDER MONITOR
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK  
PART NUMBER: 2294825

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. THE VIEWFINDER MONITOR USED WITH MID DECK  
TV CAMERAS FOR SETUP AND ADJUSTMENTS. FAILURE WOULD MAKE  
ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN LOST OF MID  
DECK SCENES. LOSS OF LIKE AND UNLIKE REDUND WOULD NOT CAUSE LOSS  
OF MISSION. (LIKE REDUND, FLT DECK  
VIEWFINDER, AND UNLIKE VIA TWO CONSOLE MONITORS IN AFT CABIN AND  
MONITORS ON THE GROUND.)

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-566

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8067 ABORT: 3/3

ITEM: CONSOLE MONITOR  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) CONSOLE MONITOR
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: CABIN  
PART NUMBER: 2291585

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE TV CONSOLE MONITOR PROVIDES CAP TO VIEW SCENES FROM ALL TV CAMERAS (TVC) AND VCR OUTPUTS. LOSS OF ALL CAPABILITY TO OBTAIN DISPLAYS OF TVC SCENES VIA LIKE OR UNLIKE REDUND. WOULD MAKE TVC POINTING AND PICTURE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN POSSIBLE LOSS OF CCTV COVERAGE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW. (LIKE REDUND, A SECOND CONSOLE MON, AND UNLIKE VIA MONS LOCATED ON THE GND. AND VIEWFINDER MONITOR FOR CABIN CAMERAS ONLY.)

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-567

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8068 ABORT: 3/3

ITEM: CONSOLE MONITOR (CRT)  
FAILURE MODE: LOSS OF CRT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) CONSOLE MONITOR
- 4) CRT
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: CABIN  
PART NUMBER: 2291585

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE TV CONSOLE MONITOR PROVIDES CAP TO VIEW SCENES FROM ALL TV CAMERAS (TVC) AND VCR OUTPUTS. LOSS OF ALL CAPABILITY TO OBTAIN DISPLAYS OF TVC SCENES VIA LIKE OR UNLIKE REDUND WOULD MAKE TVC POINTING AND PICTURE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN POSSIBLE LOSS OF CCTV COVERAGE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW. (LIKE REDUND, A SECOND CONSOLE MON, AND UNLIKE VIA MONS LOCATED ON THE GND. AND VIEWFINDER MONITOR FOR CABIN CAMERAS ONLY.)

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-568



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8069 ABORT: 3/3

ITEM: TV PWR CNTL UNIT SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV PWR CNTL UNIT SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S12

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) TV PWR CNTL UNIT SW APPLIES CCTV POWER FROM MAIN A OR MAIN B. FAILURE TO SW CAUSES LOSS OF CCTV FUNCTIONS RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-569

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8070 ABORT: 3/3

ITEM: TV PWR CNTL UNIT SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV PWR CNTL UNIT SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S12

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) TV PWR CNTL UNIT SW APPLIES CCTV POWER FROM MAIN A OR MAIN B. AN OPEN/SHORT SW CAUSES LOSS OF CCTV FUNCTIONS RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 . C-570

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8071 ABORT: 3/3

ITEM: TV PWR CNTL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV PWR CNTL SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S52

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE NON REDUND TV PWR CNTL SW SELECTS CMD OR PANEL CONTROL. FAILURE OF THIS SWITCH WOULD NOT RESULT IN LOSS OF MISSION. "PANEL" POSITION REQUIRES THAT ALL FUNCTIONS BE SELECTED BY THE CREW AND THE "CMD" POSITION WILL ALLOW FUNCTIONS TO BE SELECTED VIA GPC COMMANDS OR MANUALLY BY THE CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-571

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8072 ABORT: 3/3

ITEM: TV PWR CNTL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV PWR CNTL SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S52

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE NON REDUND TV PWR CNTL SW SELECTS CMD OR PANEL CONTROL. FAILURE OF THIS SWITCH WOULD NOT RESULT IN LOSS OF MISSION. PANEL POSITION REQUIRES THAT ALL FUNCTIONS BE SELECTED BY THE CREW AND THE CMD POSITION WILL ALLOW FUNCTIONS TO BE SELECTED VIA GPC COMMANDS OR CREW SELECTION. AN OPEN SWITCH WOULD REQUIRE THAT ALL CCTV FUNCTIONS BE SELECTED BY THE CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-572

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8073 ABORT: 3/3

ITEM: TV SYNC SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV SYNC SWITCH S18
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S18

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) THE TV SYNC SW ALLOWS SELECTION OF SYNC OSC. FAILURE TO SW WOULD NOT BE BASIS FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHJUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-573

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8074 ABORT: 3/3

ITEM: TV SYNC SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV SYNC SWITCH S18
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S18

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) TV SYNC SW ALLOWS SELECTION OF SYNC OSC. OPEN/SHORT SW WOULD CAUSE LOSS OF SYNC OSC AND TVC SELECTION CONTROL REDUCING CCTV CAP RESULTING IN POTENTIAL LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-574

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8075 ABORT: 3/3

ITEM: TV DOWNLINK SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV DOWNLINK SWITCH S11
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S11

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) FAILURE CAUSES LOSS OF DOWNLINK VIDEO. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD 08171

REPORT DATE 12/31/87

C-575

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8076 ABORT: 3/3

ITEM: TV DOWNLINK SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV DOWNLINK SWITCH S11
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S11

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) SHORT CAUSES LOSS OF DOWNLINK VIDEO AND OPEN ENABLES DOWNLINK VIDEO. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-576



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8077 ABORT: 3/3

ITEM: TV CAMERA POWER SWITCH (TVC A)  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) PWR SW
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S13

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) SW PROVIDE PWR TO TVC A PORT. FAILURE PREVENTS OPERATION TVC A AND COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-577

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8078 ABORT: 3/3

ITEM: TV CAMERA POWER SWITCH (TVC A)  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) PWR SW
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S13

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) SW PROVIDE PWR TO TVC A PORT. OPEN/SHORT PREVENTS OPERATION TVC A AND COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-578

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8079 ABORT: 3/3

ITEM: TV CAMERA POWER SWITCH (TVC B)  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) PWR SW
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S14

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) SW PROVIDES PWR TO TVC B PORT. FAILURE PREVENTS OPERATION OF TVC B AND COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-579

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8080 ABORT: 3/3

ITEM: TV CAMERA POWER SWITCH (TVC B)  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) PWR SW
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S14

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) SW PROVIDES PWR TO TVC B PORT. OPEN/SHORT PREVENTS OPERATION OF TVC B AND COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-580

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8081 ABORT: 3/3

ITEM: TV CAMERA POWER SWITCH (TVC C)  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) PWR SW
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S15

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) SW PROVIDE PWR TO TVC C PORT. FAILURE PREVENTS OPERATION OF TVC C AND COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-581

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8082 ABORT: 3/3

ITEM: TV CAMERA POWER SWITCH (TVC C)  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) PWR SW
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S15

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) SW PROVIDE PWR TO TVC C PORT. OPEN/SHORT PREVENTS OPERATION OF TVC C AND COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-582

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8083 ABORT: 3/3

ITEM: TV CAMERA POWER SWITCH (TVC D)  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) PWR SW
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S16

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) SW PROVIDE PWR TO TVC D PORT. FAILURE PREVENTS OPERATION OF TVC D AND COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-583

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8084 ABORT: 3/3

ITEM: TV CAMERA POWER SWITCH (TVC D)  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) PWR SW
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S16

CAUSES: MECHANICAL SHORT, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) SW PROVIDE PWR TO TVC D PORT. OPEN/SHORT PREVENTS OPERATION OF TVC D AND COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-584



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8085 ABORT: 3/3

ITEM: TV CAMERA POWER SWITCH (RMS TVCS)  
FAILURE MODE: FAILS TO SW

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) PWR SW
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/2R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S17

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) SW PROVIDES PWR TO RMS TVC PORT. FAILURE PREVENTS OPERATION OF RMS TVCS AND COULD RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-585

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8086 ABORT: 3/3

ITEM: TV CAMERA POWER SWITCH (RMS TVCS)  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) PWR SW
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S17

CAUSES: MECHANICAL SHORT, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) SW PROVIDES PWR TO RMS TVC PORT. OPEN/SHORT PREVENTS OPERATION OF RMS TVCS AND COULD RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-586

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8087 ABORT: 3/3

ITEM: TV PWR SWITCH (FLT DECK TVC)  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV PWR SW
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL 019  
PART NUMBER: S1

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) FAILURE WOULD CAUSE LOSS OF FLT DECK TV CAMERA (TVC). NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-587

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 5/15/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8088 ABORT: 3/3

ITEM: TV PWR SWITCH (FLT DECK TVC)  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV PWR SW
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL 019  
PART NUMBER: S1

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) OPEN/SHORT WOULD CAUSE LOSS OF FLT DECK TV CAMERA (TVC). NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-588

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8089 ABORT: 3/3

ITEM: TV PWR SWITCH (MID DECK TVC)  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV PWR SW
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL 058F  
PART NUMBER: S10

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) FAILURE WOULD CAUSE LOSS OF FLT DECK TV CAMERA (TVC). NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-589

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8090 ABORT: 3/3

ITEM: TV PWR SWITCH (MID DECK TVC)  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV PWR SW
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL 058F  
PART NUMBER: S10

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) OPEN/SHORT WOULD CAUSE LOSS OF FLT DECK TV CAMERA (TVC). NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-590

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8091 ABORT: 3/3

ITEM: RMS TV CAMERA SELECT SW (STBD)  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) RMS TVC SELECT SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S53

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD AND PORT RMS SW.) SW SELECTS WRIST OR ELBOW TVC FOR STBD RMS. FAILURE WOULD REDUCE STBD RMS TV COVERAGE CAPABILITY BUT WOULD NOT BE CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-591

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8092 ABORT: 3/3

ITEM: RMS TV CAMERA SELECT SW (STBD)  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) RMS TVC SELECT SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S53

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD AND PORT RMS SW.) SW SELECTS WRIST OR ELBOW TVC FOR STBD RMS. OPEN/SHORT SWITCH WOULD LOSE STBD RMS TV CAPABILITY RESULTING IN POSSIBLE LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-592



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8093 ABORT: 3/3

ITEM: RMS TV CAMERA SELECT SW (PORT)  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) RMS TVC SELECT SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S54

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD AND STBD RMS SW.) SW SELECTS WRIST OR ELBOW TVC FOR PORT RMS. FAILURE WOULD REDUCE PORT RMS TV COVERAGE CAP BUT WOULD NOT BE CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-593

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87  
SUBSYSTEM: COMM AND TRACK  
MDAC ID: 8094

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 3/3

ITEM: RMS TV CAMERA SELECT SW (PORT)  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) RMS TVC SELECT SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S54

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD AND STBD RMS SW.) SW SELECTS WRIST OR ELBOW TVC FOR PORT RMS. OPEN/SHORT SWITCH WOULD LOSE PORT RMS TV CAP RESULTING IN POSSIBLE LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-594

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8095 ABORT: 3/3

ITEM: TV CAMERA CMD FOCUS SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) CMD FOCUS SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	2/1R		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S40

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD AND FOCUS SW LOCATED ON LENS ASSY.) FAILURE WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF TVC CAP AND POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-595

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8096 ABORT: 3/3

ITEM: TV CAMERA CMD FOCUS SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) CMD FOCUS SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S40

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD AND FOCUS SW LOCATED ON LENS ASSY.) OPEN/SHORT WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF TVC CAP AND POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-596

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8097 ABORT: 3/3

ITEM: TV CAMERA CMD ZOOM SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) CMD ZOOM SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	2/1R		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S41

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD AND ZOOM SW LOCATED ON LENS ASSEMBLY.) FAILURE WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF TVC CAP RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-597

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8098 ABORT: 3/3

ITEM: TV CAMERA CMD ZOOM SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) CMD ZOOM SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S41

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD AND ZOOM SW LOCATED ON LENS ASSEMBLY.) OPEN/SHORT WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF TVC CAP RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-598

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8099 ABORT: 3/3

ITEM: TV CAMERA CMD IRIS SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) CMD IRIS SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S42

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD AND IRIS SW LOCATED ON LENS ASSEMBLY.) FAILURE WOULD PREVENT IRIS CONTROL CAUSING LOSS OF TVC CAPABILITY RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-599

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8100 ABORT: 3/3

ITEM: TV CAMERA CMD IRIS SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) CMD IRIS SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S42

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD AND IRIS SW LOCATED ON LENS ASSEMBLY.) OPEN/SHORT WOULD PREVENT IRIS CONTROL CAUSING LOSS OF TVC CAPABILITY RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-600



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8101 ABORT: 3/3

ITEM: TV CAMERA CMD TILT SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) CMD TILT SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S43

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) FAILURE WOULD PREVENT TILT TRACKING CONTROL CAUSING LOSS OF TVC CAP RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-601

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8102 ABORT: 3/3

ITEM: TV CAMERA CMD TILT SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) CMD TILT SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S43

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) OPEN/SHORT WOULD PREVENT TILT TRACKING CONTROL CAUSING LOSS OF TVC CAP RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-602

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8103 ABORT: 3/3

ITEM: TV CAMERA CMD PAN SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) CMD PAN SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	2/1R		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S44

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) FAILURE WOULD PREVENT PAN TRACKING CONTROL CAUSING LOSS OF TVC CAP RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-603

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8104 ABORT: 3/3

ITEM: TV CAMERA CMD PAN SWITCH  
FAILURE MODE: ELECTRICAL OPEN SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) CMD PAN SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S44

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) OPEN/SHORT WOULD PREVENT PAN TRACKING CONTROL CAUSING LOSS OF TVC CAP RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-604

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8105 ABORT: 3/3

ITEM: TV CAMERA PANTILT SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) PANTILT SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	3/3		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S56

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) P/T SW CONTROLS RATE OF PANTILT TRAVEL. FAILURE WOULD NOT CONSTITUTE LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-605

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8106 ABORT: 3/3

ITEM: TV CAMERA PANTILT SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) PANTILT SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S16

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) A SLEW RATE MUST BE SELECTED SO THAT AN OPEN/SHORT WOULD CAUSE LOSS OF P/T CAP RESULTING IN LOSS OF TARGET TRACKING CAP AND LIMITED CCTV COVERAGE. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1, .12, .13, .24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-606

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8107 ABORT: 3/3

ITEM: TV CAMERA ALC CMD SWITCH (PEAK)  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) ALC CMD SWITCH (PEAK)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S45

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD AND IRIS SW.) EACH TVC ALC SW SELECTS A RANGE OF SCENE BRIGHTNESS. FAILURE TO SW PREVENTS NORMALIZING PICTURE BRIGHTNESS. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-607

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8108 ABORT: 3/3

ITEM: TV CAMERA ALC CMD SWITCH (PEAK)  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) ALC CMD SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S45

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGES OF SCENE BRIGHTNESS CONTROL. SHORTED SW CAUSES LOCK IN SELECTED MODE PREVENTING NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-608



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8109 ABORT: 3/3

ITEM: TV CAMERA ALC CMD SWITCH (NORM)  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) ALC CMD SWITCH (NORM)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S46

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD AND IRIS SW.) EACH TVC ALC SW SELECTS A RANGE OF SCENE BRIGHTNESS. FAILURE TO SW PREVENTS NORMALIZING PICTURE BRIGHTNESS. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-609

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8110 ABORT: 3/3

ITEM: TV CAMERA ALC CMD SWITCH (NORM)  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) ALC CMD SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S46

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGES OF SCENE BRIGHTNESS CONTROL. SHORTED SW CAUSES LOCK IN SELECTED MODE PREVENTING NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-610

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8111 ABORT: 3/3

ITEM: TV CAMERA ALC CMD SWITCH (AVG)  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) ALC CMD SWITCH (AVG)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S47

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD AND IRIS SW.) EACH TVC ALC SW SELECTS A RANGE OF SCENE BRIGHTNESS. FAILURE TO SW PREVENTS NORMALIZING PICTURE BRIGHTNESS. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87. C-611

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8112 ABORT: 3/3

ITEM: TV CAMERA ALC CMD SWITCH (AVG)  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) ALC CMD SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S47

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGES OF SCENE BRIGHTNESS CONTROL. SHORTED SW CAUSES LOCK IN SELECTED MODE PREVENTING NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-612

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8113 ABORT: 3/3

ITEM: TV CAMERA GAMMA CMD SWITCH (WHITE STRCH)  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) GAMMA CMD SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S48

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON TVC AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-613

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8114 ABORT: 3/3

ITEM: TV CAMERA GAMMA CMD SWITCH (WHITE STRCH)  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) GAMMA CMD SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S48

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON TVC AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. SHORT LOCKS POSITION AND PREVENTS SHADE CORRECTING CAP. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-614

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8115 ABORT: 3/3

ITEM: TV CAMERA GAMMA CMD SWITCH (NORM)  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) GAMMA CMD SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S49

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON TVC AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-615

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8116 ABORT: 3/3

ITEM: TV CAMERA GAMMA CMD SWITCH (NORM)  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) GAMMA CMD SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S49

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON TVC AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. SHORT LOCKS POSITION AND PREVENTS SHADE CORRECTING CAP. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-616



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8117 ABORT: 3/3

ITEM: TV CAMERA GAMMA CMD SWITCH (BLACK STRCH)  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) GAMMA CMD SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S50

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON TVC AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-617

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8118 ABORT: 3/3

ITEM: TV CAMERA GAMMA CMD SWITCH (BLACK STRCH)  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) GAMMA CMD SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S50

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON TVC AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. SHORT LOCKS POSITION AND PREVENTS SHADE CORRECTING CAP. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-618

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8119 ABORT: 3/3

ITEM: TV VIDEO INPUT PBI [FLT DECK TVC SELECT] SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO INPUT PBI (PUSH BUTTON INDICATOR) SWITCH
- 4) FLT DECK TVC
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S32

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) PBI SW SELECTS INPUT FROM FLT DECK TVC FOR OUTPUT TO DOWNLINK, MONITORS, MUX'S, OR P/L. FAILURE TO SW NOT CAUSE FOR LOSS OF CCTV CAPABILITY OR MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-619

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8120 ABORT: 3/3

ITEM: TV VIDEO INPUT PBI [FLT DECK TVC SELECT] SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO INPUT PBI (PUSH BUTTON INDICATOR) SWITCH
- 4) FLT DECK TVC
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S32

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) PBI SW SELECTS INPUT FROM FLT DECK TVC FOR OUTPUT TO DOWNLINK, MONITORS, MUX'S, OR P/L. OPEN/SHORT SW NOT CAUSE FOR LOSS OF CCTV CAPABILITY OR MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-620

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8121 ABORT: 3/3

ITEM: TV VIDEO INPUT PBI [MID DECK TVC SELECT] SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO INPUT PBI (PUSH BUTTON INDICATOR) SWITCH
- 4) MID DECK TVC
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1

PART NUMBER: S55

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) PBI SW SELECTS INPUT FROM MID DECK TVC FOR OUTPUT TO DOWNLINK, MONITORS, MUX'S, OR P/L. FAILURE TO SW NOT CAUSE FOR LOSS OF CCTV CAPABILTY OR MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-621

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8122 ABORT: 3/3

ITEM: TV VIDEO INPUT PBI [MID DECK TVC SELECT] SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO INPUT PBI (PUSH BUTTON INDICATOR) SWITCH
- 4) MID DECK TVC
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S55

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) PBI SW SELECTS INPUT FROM MID DECK TVC FOR OUTPUT TO DOWNLINK, MONITORS, MUX'S, OR P/L. OPEN/SHORT SW NOT CAUSE FOR LOSS OF CCTV CAPABILTY OR MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-622

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8123 ABORT: 3/3

ITEM: TV VIDEO INPUT PBI [TVC A FWD BAY SELECT] SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO INPUT PBI (PUSH BUTTON INDICATOR) SWITCH
- 4) TVC A
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S27

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) PBI SW SELECTS INPUT FROM TVC A FOR OUTPUT TO DOWNLINK, MONITORS, MUX'S, OR P/L. FAILURE TO SW COULD CAUSE LOSS OF TVC A CAP AND POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-623

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8124 ABORT: 3/3

ITEM: TV VIDEO INPUT PBI [TVC A SELECT] SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO INPUT PBI (PUSH BUTTON INDICATOR) SWITCH
- 4) TVC A
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S27

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) PBI SW SELECTS INPUT FROM TVC A FOR OUTPUT TO DOWNLINK, MONITORS, MUX'S, OR P/L. OPEN/SHORT SW COULD CAUSE LOSS OF TVC A CAP AND POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-624



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8125 ABORT: 3/3

ITEM: TV VIDEO INPUT PBI [TVC B KEEL/EVA SELECT] SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO INPUT PBI (PUSH BUTTON INDICATOR) SWITCH
- 4) TVC B
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	2/1R		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S28

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) PBI SW SELECTS INPUT FROM TVC B FOR OUTPUT TO DOWNLINK, MONITORS, MUX'S, OR P/L. FAILURE TO SW COULD CAUSE LOSS OF TVC B CAP AND POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-625

C-8

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8126 ABORT: 3/3

ITEM: TV VIDEO INPUT PBI [TVC B SELECT] SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO INPUT PBI (PUSH BUTTON INDICATOR) SWITCH
- 4) TVC B
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S28

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) PBI SW SELECTS INPUT FROM TVC B FOR OUTPUT TO DOWNLINK, MONITORS, MUX'S, OR P/L. OPEN/SHORT SW COULD CAUSE LOSS OF TVC B CAP AND POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-626

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8127 ABORT: 3/3

ITEM: TV VIDEO INPUT PBI [TVC C AFT BAY SELECT] SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO INPUT PBI (PUSH BUTTON INDICATOR) SWITCH
- 4) TVC C
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	2/1R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S29

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) PBI SW SELECTS INPUT FROM TVC C FOR OUTPUT TO DOWNLINK, MONITORS, MUX'S, OR P/L. FAILURE TO SW COULD CAUSE LOSS OF TVC C CAP AND POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-627

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8128 ABORT: 3/3

ITEM: TV VIDEO INPUT PBI [TVC C SELECT] SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO INPUT PBI (PUSH BUTTON INDICATOR) SWITCH
- 4) TVC C
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S29

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) PBI SW SELECTS INPUT FROM TVC C FOR OUTPUT TO DOWNLINK, MONITORS, MUX'S, OR P/L. OPEN/SHORT SW COULD CAUSE LOSS OF TVC C CAP AND POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-628

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC.ID: 8129 ABORT: 3/3

ITEM: TV VIDEO INPUT PBI [TVC D RMS STBD SELECT] SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO INPUT PBI (PUSH BUTTON INDICATOR) SWITCH
- 4) TVC D
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S30

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) PBI SW SELECTS INPUT FROM TVC D FOR OUTPUT TO DOWNLINK, MONITORS, MUX'S, OR P/L. FAILURE TO SW COULD CAUSE LOSS OF TVC D CAP AND POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-629

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8130 ABORT: 3/3

ITEM: TV VIDEO INPUT PBI [TVC D SELECT] SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO INPUT PBI (PUSH BUTTON INDICATOR) SWITCH
- 4) TVC D
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S30

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) PBI SW SELECTS INPUT FROM TVC D FOR OUTPUT TO DOWNLINK, MONITORS, MUX'S, OR P/L. OPEN/SHORT SW COULD CAUSE LOSS OF TVC D CAP AND POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-630

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8131 ABORT: 3/3

ITEM: TV VIDEO INPUT PBI [RMS TVC SELECT] SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO INPUT PBI (PUSH BUTTON INDICATOR) SWITCH
- 4) TVC RMS WRIST OR ELBOW
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	3/2R		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S31

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) PBI SW SELECTS INPUT FROM RMS TVC (WRIST OR ELBOW) FOR OUTPUT TO DOWNLINK, MONITORS, MUX'S, OR P/L. FAILURE TO SW COULD CAUSE LOSS OF RMS TVC CAP AND POSSIBLE LOSS OF MISSION..

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-631

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8132 ABORT: 3/3

ITEM: TV VIDEO INPUT PBI [RMS TVC SELECT] SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO INPUT PBI (PUSH BUTTON INDICATOR) SWITCH
- 4) RMS TVC WRIST OR ELBOW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1

PART NUMBER: S31

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) PBI SW SELECTS INPUT FROM RMS TVC FOR OUTPUT TO DOWNLINK, MONITORS, MUX'S, OR P/L. OPEN/SHORT SW COULD CAUSE LOSS OF RMS (WRIST OR ELBOW) TVC CAP AND POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-632



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8133 ABORT: 3/3

ITEM: TV VIDEO INPUT PBI [P/L 1,2,OR 3 TVC SELECT] SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO INPUT PBI (PUSH BUTTON INDICATOR) SWITCH
- 4) P/L 1,2, OR 3 TVC PORT SELECT SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S33, S34, S35

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) THREE SW SELECT P/L TVC AND VCR PORTS, FOR OUTPUT TO DOWNLINK, MONITORS, MUX'S OR P/L. FAILURE TO SELECT REQUIRED TVC COULD CAUSE LOSS OF DEDICATED EXPERIMENT. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-633

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8134 ABORT: 3/3

ITEM: TV VIDEO INPUT PBI [P/L 1,2,OR 3 TVC SELECT] SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO INPUT PBI (PUSH BUTTON INDICATOR) SWITCH
- 4) P/L 1,2, OR 3 TVC PORT SELECT SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S33, S34, S35

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) THREE SW SELECT P/L TVC AND VCR PORTS, FOR OUTPUT TO DOWNLINK, MONITORS, MUX'S OR P/L. OPEN/SHORT SW COULD CAUSE LOSS OF TVC AND DEDICATED EXPERIMENT. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-634

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8135 ABORT: 3/3

ITEM: TV VIDEO INPUT PBI [MUX 1 & MUX 2 SELECT] SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO INPUT PBI (PUSH BUTTON INDICATOR) SWITCH
- 4) MUX 1 & MUX 2 SELECT SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S36, S37

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) TWO SWITCHES SELECT MUX 1 OR MUX 2. ONE SW FOR EACH PORT FOR OUTPUT TO DOWNLINK AND MONITORS. FAILURE WOULD NOT CAUSE LOSS OF CCTV OR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-635

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8136 ABORT: 3/3

ITEM: TV VIDEO INPUT PBI [MUX 1 & MUX 2 SELECT] SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO INPUT PBI (PUSH BUTTON INDICATOR) SWITCH
- 4) MUX 1 & MUX 2 SELECT SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S36, S37

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) TWO SWITCHES SELECT MUX 1 OR MUX 2. ONE SW FOR EACH PORT FOR OUTPUT TO DOWNLINK AND MONITORS. OPEN/SHORT SW WOULD NOT CAUSE LOSS OF CCTV OR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-636

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8137 ABORT: 3/3

ITEM: TV VIDEO INPUT PBI [TEST SELECT] SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO INPUT PBI (PUSH BUTTON INDICATOR) SWITCH
- 4) TEST SELECT SW
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	HDW/FUNC
PRELAUNCH:	3/3	ABORT	
LIFTOFF:	3/3	RTLS:	3/3
ONORBIT:	3/3	TAL:	3/3
DEORBIT:	3/3	AOA:	3/3
LANDING/SAFING:	3/3	ATO:	3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S78

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) THIS SW PROVIDES TEST PATTERNS FOR SYSTEM CHECKOUT VIA DOWNLINK AND MONITORS. FAILURE TO SW WOULD NEGATE THIS CAPABILITY. NO CAUSE FOR LOSS OF CCTV OR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-637

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8138 ABORT: 3/3

ITEM: TV VIDEO INPUT PBI [TEST SELECT] SWITCH  
FAILURE MODE: SHORTED

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO INPUT PBI (PUSH BUTTON INDICATOR) SWITCH
- 4) TEST SELECT SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S78

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) THIS SW PROVIDES TEST PATTERNS FOR SYSTEM CHECKOUT VIA DOWNLINK AND MONITORS. OPEN/SHORT SW WOULD NEGATE THIS CAPABILITY. NO CAUSE FOR LOSS OF CCTV OR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-638

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8139 ABORT: 3/3

ITEM: TV VIDEO OUTPUT PBI [MUX SELECT] SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO OUTPUT PBI (PUSH BUTTON INDICATOR) SWITCH
- 4) MUX SELECT SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S20, S21, S24, S25

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) SWITCHES SELECT MUX OUTPUTS FOR ROUTING TO DOWNLINK, MONITORS OR PAYLOAD AND SELECTS SPLIT SCREEN VIEWING. FAILURE TO SW WOULD NEGATE THIS CAP. NOT CAUSE FOR LOSS OF CCTV OR MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8140 ABORT: 3/3

ITEM: TV VIDEO OUTPUT PBI [MUX SELECT] SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO OUTPUT PBI (PUSH BUTTON INDICATOR) SWITCH
- 4) MUX SELECT SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S20, S21, S24, S25

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) SWITCHES SELECT MUX OUTPUTS FOR ROUTING TO DOWNLINK, MONITORS OR PAYLOAD AND SELECTS SPLIT SCREEN VIEWING. OPEN/SHORT SW WOULD NEGATE THIS CAP. NOT CAUSE FOR LOSS OF CCTV OR MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 8141 ABORT: 3/3

ITEM: TV VIDEO OUTPUT PBI [MON SELECT] SWITCH  
FAILURE MODE: FAILS TO SWITCH-

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO OUTPUT PBI (PUSH BUTTON INDICATOR)
- 4) MON SELECT SW
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	HDW/FUNC
		ABORT	
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S19, S23

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. TV CONSOLE MONITOR PROVIDES CAP TO VIEW SCENES FROM ALL TV CAMERA (TVC) AND VCR OUTPUTS. LOSS OF ALL CAPABILITY TO OBTAIN DISPLAYS OF TVC SCENES VIA LIKE OR UNLIKE REDUND. WOULD MAKE TVC POINTING AND PICTURE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW. (LIKE REDUND, A SECOND CON MON AND SW, AND UNLIKE VIA MONS LOCATED ON THE GND AND VIEWFINDER MON FOR CABIN CAM ONLY. NO GPC CMD.) EACH SW SEL OUTPUT FOR MON VIDEO INPUT SIG. FAILURE RESULTS IN POSS LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 8142 ABORT: 3/3

ITEM: TV VIDEO OUTPUT PBI [MON SELECT] SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO OUTPUT PBI (PUSH BUTTON INDICATOR)
- 4) MON SELECT SW
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	3/1R		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A7A1  
PART NUMBER: S19, S23

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. TV CONSOLE MONITOR PROVIDES CAP TO VIEW. SCENES FROM ALL TV CAMERA (TVC) AND VCR OUTPUTS. LOSS OF ALL CAPABILITY TO OBTAIN DISPLAYS OF TVC SCENES VIA LIKE OR UNLIKE REDUND. WOULD MAKE TVC POINTING AND PICTURE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW. (LIKE REDUND, A SECOND CON MON AND SW, AND UNLIKE VIA MONS LOCATED ON THE GND AND VIEWFINDER MON FOR CABIN CAM ONLY. NO GPC CMD.) EACH SW SEL OUTPUT FOR MON VIDEO INPUT SIG. OPEN/SHORT SW RESULTS IN POSS LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1, .12, .13, .24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-642

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8143 ABORT: 3/3

ITEM: TV VIDEO OUTPUT PBI [P/L SELECT] SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO OUTPUT PBI (PUSH BUTTON INDICATOR) SWITCH
- 4) P/L SELECT SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S26

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) SWITCH SELECTS OUTPUT FOR ROUTING TO A P/L FOR DISPLAY, DOWNLINK OR RECORDING. FAILURE TO SW WOULD NEGATE THIS CAPABILITY AND NOT RESULT IN LOSS OF CCTV OR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8144 ABORT: 3/3

ITEM: TV VIDEO OUTPUT PBI [P/L SELECT] SWITCH  
FAILURE MODE: OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO OUTPUT PBI (PUSH BUTTON INDICATOR) SWITCH
- 4) P/L SELECT SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S26

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) SWITCH SELECTS OUTPUT FOR ROUTING TO A P/L FOR DISPLAY, DOWNLINK OR RECORDING. OPEN/SHORT SW WOULD NEGATE THIS CAPABILITY AND NOT RESULT IN LOSS OF CCTV OR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-644

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8145 ABORT: 3/3

ITEM: TV VIDEO OUTPUT PBI [DOWNLINK SELECT] SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO OUTPUT PBI (PUSH BUTTON INDICATOR) SWITCH
- 4) DOWNLINK SELECT SW
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S22

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) SWITCH SELECTS OUTPUT FOR ROUTING TV TO GND. FAILURE TO SW WOULD CAUSE LOSS OF DOWNLINK TV CHANNEL. WOULD NOT RESULT IN LOSS OF ON BOARD CCTV OR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-645

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8146 ABORT: 3/3

ITEM: TV VIDEO OUTPUT PBI [DOWNLINK SELECT] SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV VIDEO OUTPUT PBI (PUSH BUTTON INDICATOR) SWITCH
- 4) DOWNLINK SELECT SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A7A1  
PART NUMBER: S22

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD.) SWITCH SELECTS OUTPUT FOR ROUTING TV TO GND. OPEN/SHORT SW WOULD CAUSE LOSS OF DOWNLINK TV CHANNEL SELECTION. WOULD NOT RESULT IN LOSS OF ON BOARD CCTV OR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-646

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8147 ABORT: 3/3

ITEM: TVC A PEAK ALC CONTROL SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC A  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PAN A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. FAILURE TO SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-647

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8148 ABORT: 3/3

ITEM: TVC A PEAK ALC CONTROL SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC A  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. OPEN/SHORT SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-648



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8149 ABORT: 3/3

ITEM: TVC A NORM ALC CONTROL SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC A  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PAN A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. FAILURE TO SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-649

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8150 ABORT: 3/3

ITEM: TVC A NORM ALC CONTROL SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC A  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. OPEN/SHORT SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-650

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8151 ABORT: 3/3

ITEM: TVC A AVG ALC CONTROL SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC A  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PAN A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. FAILURE TO SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-651

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8152 ABORT: 3/3

ITEM: TVC A AVG ALC CONTROL SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC A  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. OPEN/SHORT SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-652

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8153 ABORT: 3/3

ITEM: TVC B PEAK ALC CONTROL SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC B  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PAN A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. FAILURE TO SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 . C-653

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8154 ABORT: 3/3

ITEM: TVC B PEAK ALC CONTROL SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC B

PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. OPEN/SHORT SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-654

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8155 ABORT: 3/3

ITEM: TVC B NORM ALC CONTROL SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC B  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PAN A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. FAILURE TO SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-655

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8156 ABORT: 3/3

ITEM: TVC B NORM ALC CONTROL SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC B

PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. OPEN/SHORT SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-656



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8157 ABORT: 3/3

ITEM: TVC B AVG ALC CONTROL SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	3/3		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC B  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PAN A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. FAILURE TO SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-657

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8158 ABORT: 3/3

ITEM: TVC B AVG ALC CONTROL SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC B  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. OPEN/SHORT SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-658

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8159 ABORT: 3/3

ITEM: TVC C PEAK ALC CONTROL SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	3/3		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC C  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PAN A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. FAILURE TO SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-659

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8160 ABORT: 3/3

ITEM: TVC C PEAK ALC CONTROL SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC C  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. OPEN/SHORT SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-660

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8161 ABORT: 3/3

ITEM: TVC C NORM ALC CONTROL SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC C  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PAN A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. FAILURE TO SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-661

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8162 ABORT: 3/3

ITEM: TVC C NORM ALC CONTROL SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC C  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. OPEN/SHORT SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-662

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8163 ABORT: 3/3

ITEM: TVC C AVG ALC CONTROL SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC C  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PAN A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. FAILURE TO SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-663

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8164 ABORT: 3/3

ITEM: TVC C AVG ALC CONTROL SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC C  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. OPEN/SHORT SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-664



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8165 ABORT: 3/3

ITEM: TVC D PEAK ALC CONTROL SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	3/3		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC D  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PAN A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. FAILURE TO SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-665

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8166 ABORT: 3/3

ITEM: TVC D PEAK ALC CONTROL SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC D  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. OPEN/SHORT SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-666

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8167 ABORT: 3/3

ITEM: TVC D NORM ALC CONTROL SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC D  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PAN A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. FAILURE TO SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-667

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8168 ABORT: 3/3

ITEM: TVC D NORM ALC CONTROL SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC D  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. OPEN/SHORT SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-668

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8169 ABORT: 3/3

ITEM: TVC D AVG ALC CONTROL SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC D

PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PAN A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. FAILURE TO SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-669

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8170 ABORT: 3/3

ITEM: TVC D AVG ALC CONTROL SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC D

PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. OPEN/SHORT SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-670

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8171 ABORT: 3/3

ITEM: RMS WRIST TVC PEAK ALC CONTROL SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: RMS WRIST TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PAN A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. FAILURE TO SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-671

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8172 ABORT: 3/3

ITEM: RMS WRIST TVC PEAK ALC CONTROL SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: RMS WRIST TVC D  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. OPEN/SHORT SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-672



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8173 ABORT: 3/3

ITEM: RMS WRIST TVC NORM ALC CONTROL SW (PEAK)  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: RMS WRIST TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PAN A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. FAILURE TO SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-673

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8174 ABORT: 3/3

ITEM: RMS WRIST TVC NORM ALC CONTROL SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: RMS WRIST TVC D  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. OPEN/SHORT SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-674

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8175 ABORT: 3/3

ITEM: RMS WRIST TVC AVG ALC CONTROL SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: RMS WRIST TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PAN A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. FAILURE TO SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-675

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8176 ABORT: 3/3

ITEM: RMS WRIST TVC AVG ALC CONTROL SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: RMS WRIST TVC D  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. OPEN/SHORT SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-676

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8177 ABORT: 3/3

ITEM: RMS ELBOW TVC PEAK ALC CONTROL SW (PEAK)  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	3/3		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: RMS ELBOW TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PAN A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. FAILURE TO SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-677

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8178 ABORT: 3/3

ITEM: RMS ELBOW TVC PEAK ALC CONTROL SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: RMS ELBOW TVC D

PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. OPEN/SHORT SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-678

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8179 ABORT: 3/3

ITEM: RMS ELBOW TVC NORM ALC CONTROL SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: RMS ELBOW TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PAN A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. FAILURE TO SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-679

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8180 ABORT: 3/3

ITEM: RMS ELBOW TVC NORM ALC CONTROL SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: RMS ELBOW TVC D  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. OPEN/SHORT SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-680



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8181 ABORT: 3/3

ITEM: RMS ELBOW TVC AVG ALC CONTROL SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: RMS ELBOW TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PAN A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. FAILURE TO SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-681

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8182 ABORT: 3/3

ITEM: RMS ELBOW TVC AVG ALC CONTROL SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: RMS ELBOW TVC D  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. OPEN/SHORT SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-682

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8183 ABORT: 3/3

ITEM: FLT DECK TVC PEAK ALC CONTROL SW (PEAK)  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PAN A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. FAILURE TO SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-683

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8184 ABORT: 3/3

ITEM: FLT DECK TVC PEAK ALC CONTROL SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. OPEN/SHORT SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-684

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8185 ABORT: 3/3

ITEM: FLT DECK TVC NORM ALC CONTROL SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PAN A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. FAILURE TO SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-685

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8186 ABORT: 3/3

ITEM: FLT DECK TVC NORM ALC CONTROL SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. OPEN/SHORT SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-686

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8187 ABORT: 3/3

ITEM: FLT DECK TVC AVG ALC CONTROL SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	3/3		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PAN A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. FAILURE TO SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-687

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8188 ABORT: 3/3

ITEM: FLT DECK TVC AVG ALC CONTROL SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. OPEN/SHORT SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-688



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8189 ABORT: 3/3

ITEM: MID FLT DECK TVC PEAK ALC CONTROL SW (PEAK)  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PAN A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. FAILURE TO SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-689

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8190 ABORT: 3/3

ITEM: MID DECK TVC PEAK ALC CONTROL SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. OPEN/SHORT SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-690

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8191 ABORT: 3/3

ITEM: MID FLT DECK TVC NORM ALC CONTROL SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PAN A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. FAILURE TO SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-691

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8192 ABORT: 3/3

ITEM: MID DECK TVC NORM ALC CONTROL SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. OPEN/SHORT SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-692

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8193 ABORT: 3/3

ITEM: MID FLT DECK TVC AVG ALC CONTROL SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PAN A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. FAILURE TO SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-693

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8194 ABORT: 3/3

ITEM: MID DECK TVC AVG ALC CONTROL SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) ALC CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1, REMOTE GND CMD AND IRIS SW.) THE TVC ALC SW SELECTS RANGE OF SCENE BRIGHTNESS CONTROL. OPEN/SHORT SW CAUSES LOSS OF DETAIL WHICH PREVENTS NORMALIZING PICTURE QUALITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-694

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8195 ABORT: 3/3

ITEM: TVC A WHITE STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC A  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-695

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8196 ABORT: 3/3

ITEM: TVC A WHITE STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC A  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS; ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-696



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8197 ABORT: 3/3

ITEM: TVC A NORM GAMMA CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC A  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-697

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8198 ABORT: 3/3

ITEM: TVC A NORM GAMMA CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC A  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-698

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8199 ABORT: 3/3

ITEM: TVC A BLACK STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC A  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-699

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8200 ABORT: 3/3

ITEM: TVC A BLACK STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC A  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-700

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8201 ABORT: 3/3

ITEM: TVC B WHITE STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC B  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-701

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8202 ABORT: 3/3

ITEM: TVC B WHITE STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC B  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-702

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8203 ABORT: 3/3

ITEM: TVC B NORM GAMMA CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC B  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-703

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8204 ABORT: 3/3

ITEM: TVC B NORM GAMMA CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC B  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-704



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8205 ABORT: 3/3

ITEM: TVC B BLACK STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC B  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-705

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8206 ABORT: 3/3

ITEM: TVC B BLACK STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC B  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-706

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8207 ABORT: 3/3

ITEM: TVC C WHITE STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC C  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-707

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8208 ABORT: 3/3

ITEM: TVC C WHITE STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC C  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-708

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8209 ABORT: 3/3

ITEM: TVC C NORM GAMMA CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	3/3		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC C  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-709

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8210 ABORT: 3/3

ITEM: TVC C NORM GAMMA CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC C  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-710

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8211 ABORT: 3/3

ITEM: TVC C BLACK STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC C  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-711

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8212 ABORT: 3/3

ITEM: TVC C BLACK STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC C  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE. 12/31/87

C-712



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8213 ABORT: 3/3

ITEM: TVC D WHITE STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC D  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-713

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8214 ABORT: 3/3

ITEM: TVC D WHITE STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC D  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-714

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8215 ABORT: 3/3

ITEM: TVC D NORM GAMMA CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	3/3		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC D  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-715

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8216 ABORT: 3/3

ITEM: TVC D NORM GAMMA CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC D  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-716

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8217 ABORT: 3/3

ITEM: TVC D BLACK STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC D  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-717

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8218 ABORT: 3/3

ITEM: TVC D BLACK STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: TVC D

PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

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REPORT DATE 12/31/87

C-718

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8219 ABORT: 3/3

ITEM: RMS WRIST TVC WHITE STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: RMS WRIST TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-719

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8220 ABORT: 3/3

ITEM: RMS WRIST TVC WHITE STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: RMS WRIST TVC

PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

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REPORT DATE 12/31/87

C-720



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAQ ID: 8221 ABORT: 3/3

ITEM: RMS WRIST TVC NORM GAMMA CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: RMS WRIST TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-721

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8222 ABORT: 3/3

ITEM: RMS WRIST TVC NORM GAMMA CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: RMS WRIST TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-722

C-9

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8223 ABORT: 3/3

ITEM: RMS WRIST TVC BLACK STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: RMS WRIST TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-723

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8224 ABORT: 3/3

ITEM: RMS WRIST TVC BLACK STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: RMS WRIST TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-724

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8225 ABORT: 3/3

ITEM: RMS ELBOW TVC A WHITE STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: RMS ELBOW TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-725

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8226 ABORT: 3/3

ITEM: RMS ELBOW TVC A WHITE STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: RMS ELBOW TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-726

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8227 ABORT: 3/3

ITEM: RMS ELBOW TVC A NORM GAMMA CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: RMS ELBOW TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-727

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8228 ABORT: 3/3

ITEM: RMS ELBOW TVC A NORM GAMMA CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: RMS ELBOW TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-728



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8229 ABORT: 3/3

ITEM: RMS ELBOW TVC A BLACK STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: RMS ELBOW TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-729

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8230 ABORT: 3/3

ITEM: RMS ELBOW TVC A BLACK STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: RMS ELBOW TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-730

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8231 ABORT: 3/3

ITEM: FLT DECK TVC WHITE STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-731

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8232 ABORT: 3/3

ITEM: FLT DECK TVC WHITE STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-732

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8233 ABORT: 3/3

ITEM: FLT DECK TVC NORM GAMMA CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-733

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8234 ABORT: 3/3

ITEM: FLT DECK TVC NORM GAMMA CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-734

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8235 ABORT: 3/3

ITEM: FLT DECK TVC BLACK STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-735

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8236 ABORT: 3/3

ITEM: FLT DECK TVC BLACK STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-736



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8237 ABORT: 3/3

ITEM: MID DECK TVC WHITE STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-737

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8238 ABORT: 3/3

ITEM: MID DECK TVC WHITE STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-738

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8239 ABORT: 3/3

ITEM: MID DECK TVC NORM GAMMA CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-739

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8240 ABORT: 3/3

ITEM: MID DECK TVC NORM GAMMA CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-740

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8241 ABORT: 3/3

ITEM: MID DECK TVC BLACK STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	3/3		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-741

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8242 ABORT: 3/3

ITEM: MID DECK TVC BLACK STRCH GAMMA CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) GAMMA CONTROL SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW ON PANEL A7A1 AND VIA REMOTE GND CMD.) THE TVC GAMMA SW SELECTIVELY ENHANCES LIGHT OR DARK AREAS OF PICTURE. FAILURE TO SWITCH REDUCES CAPABILITY FOR SHADE CORRECTION. SHOULD NOT RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-742

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8243 ABORT: 3/3

ITEM: TVC A MONOCHROME LENS ASSY FOCUS CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: TVC A  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF TVC A CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-743

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8244 ABORT: 3/3

ITEM: TVC A MONOCHROME LENS ASSY FOCUS CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: TVC A  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF TVC A CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-744



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8245 ABORT: 3/3

ITEM: TVC B MONOCHROME LENS ASSY FOCUS CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: TVC B

PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF TVC B CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-745

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8246 ABORT: 3/3

ITEM: TVC B MONOCHROME LENS ASSY FOCUS CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: TVC B  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF TVC B CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-746

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8247 ABORT: 3/3

ITEM: TVC C MONOCHROME LENS ASSY FOCUS CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: TVC C  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF TVC C CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-747

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8248 ABORT: 3/3

ITEM: TVC C MONOCHROME LENS ASSY FOCUS CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: TVC C  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF TVC C CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-748

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8249 ABORT: 3/3

ITEM: TVC D MONOCHROME LENS ASSY FOCUS CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: TVC D  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF TVC D CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-749

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8250 ABORT: 3/3

ITEM: TVC D MONOCHROME LENS ASSY FOCUS CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: TVC D  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF TVC D CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-750

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8251 ABORT: 3/3

ITEM: RMS WRIST TVC MONOCHROME LENS ASSY FOCUS CONTROL  
SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: RMS WRIST TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF RMS WRIST TVC CAPABILITY. COULD RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-751

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8252 ABORT: 3/3

ITEM: RMS WRIST TVC MONOCHROME LENS ASSY FOCUS CONTROL  
SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: RMS WRIST TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF RMS WRIST TVC CAPABILITY. COULD RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-752



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8253 ABORT: 3/3

ITEM: RMS ELBOW TVC MONOCHROME LENS ASSY FOCUS CONTROL  
SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: RMS ELBOW  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF RMS ELBOW TVC CAPABILITY. COULD RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-753

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8254 ABORT: 3/3

ITEM: RMS ELBOW TVC MONOCHROME LENS ASSY FOCUS CONTROL  
SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: RMS ELBOW  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF RMS ELBOW TVC CAPABILITY. COULD RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-754

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8255 ABORT: 3/3

ITEM: FLT DECK TVC MONOCHROME LENS ASSY FOCUS CONTROL  
SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF FLT DECK TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-755

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8256 ABORT: 3/3

ITEM: FLT DECK TVC MONOCHROME LENS ASSY FOCUS CONTROL  
SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF FLT DECK TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-756

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8257 ABORT: 3/3

ITEM: MID DECK TVC MONOCHROME LENS ASSY FOCUS CONTROL  
SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	3/3		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF MID DECK TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-757

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8258 ABORT: 3/3

ITEM: MID DECK TVC MONOCHROME LENS ASSY FOCUS CONTROL  
SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF ID DECK TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-758

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8259 ABORT: 3/3

ITEM: TVC A MONOCHROME LENS ASSY ZOOM CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	2/1R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: TVC A  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF TVC A CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-759

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8260 ABORT: 3/3

ITEM: TVC A MONOCHROME LENS ASSY ZOOM CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: TVC A  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF TVC A CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-760



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8261 ABORT: 3/3

ITEM: TVC B MONOCHROME LENS ASSY ZOOM CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: TVC B  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF TVC B CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-761

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8262 ABORT: 3/3

ITEM: TVC B MONOCHROME LENS ASSY ZOOM CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: TVC B

PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF TVC B CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-762

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8263 ABORT: 3/3

ITEM: TVC C MONOCHROME LENS ASSY ZOOM CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	2/1R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: TVC C  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF TVC C CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-763

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8264 ABORT: 3/3

ITEM: TVC C MONOCHROME LENS ASSY ZOOM CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: TVC C  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF TVC C CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-764

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8265 ABORT: 3/3

ITEM: TVC D MONOCHROME LENS ASSY ZOOM CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: TVC D  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF TVC D CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-765

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8266 ABORT: 3/3

ITEM: TVC D MONOCHROME LENS ASSY ZOOM CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: TVC D  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF TVC D CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-766

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8267 ABORT: 3/3

ITEM: RMS WRIST TVC MONOCHROME LENS ASSY ZOOM CONTROL  
SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: RMS WRIST TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF RMS WRIST TVC CAPABILITY. COULD RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87  
SUBSYSTEM: COMM AND TRACK  
MDAC ID: 8268

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 3/3

ITEM: RMS WRIST TVC MONOCHROME LENS ASSY ZOOM CONTROL  
SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/2R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: RMS WRIST TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF RMS WRIST TVC CAPABILITY. COULD RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8269 ABORT: 3/3

ITEM: RMS ELBOW TVC MONOCHROME LENS ASSY ZOOM CONTROL  
SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: RMS ELBOW  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF RMS ELBOW TVC CAPABILITY. COULD RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-769

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8270 ABORT: 3/3

ITEM: RMS ELBOW TVC MONOCHROME LENS ASSY ZOOM CONTROL  
SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/2R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: RMS ELBOW  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF RMS ELBOW TVC CAPABILITY. COULD RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-770

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8271 ABORT: 3/3

ITEM: FLT DECK TVC MONOCHROME LENS ASSY ZOOM CONTROL  
SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF FLT DECK TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-771

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8272 ABORT: 3/3

ITEM: FLT DECK TVC MONOCHROME LENS ASSY ZOOM CONTROL  
SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF FLT DECK TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-772

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8273 ABORT: 3/3

ITEM: MID DECK TVC MONOCHROME LENS ASSY ZOOM CONTROL  
SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF MID DECK TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-773

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8274 ABORT: 3/3

ITEM: MID DECK TVC MONOCHROME LENS ASSY ZOOM CONTROL  
SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF ID DECK TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8275 ABORT: 3/3

ITEM: TVC A MONOCHROME LENS ASSY IRIS CONTROL SWITCH  
FAILURE MODE: .FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	2/1R		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: TVC A  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE WOULD PREVENT IRIS CONTROL CAUSING LOSS OF TVC A CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-775

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8276 ABORT: 3/3

ITEM: TVC A MONOCHROME LENS ASSY IRIS CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: TVC A  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT IRIS CONTROL CAUSING LOSS OF TVC A CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8277 ABORT: 3/3

ITEM: TVC B MONOCHROME LENS ASSY IRIS CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	2/1R		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: TVC B  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE WOULD PREVENT IRIS CONTROL CAUSING LOSS OF TVC B CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-777

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8278 ABORT: 3/3

ITEM: TVC B MONOCHROME LENS ASSY IRIS CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: TVC B  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT IRIS CONTROL CAUSING LOSS OF TVC B CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-778

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8279 ABORT: 3/3

ITEM: TVC C MONOCHROME LENS ASSY IRIS CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: TVC C  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE WOULD PREVENT IRIS CONTROL CAUSING LOSS OF TVC C CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-779

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8280 ABORT: 3/3

ITEM: TVC C MONOCHROME LENS ASSY IRIS CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: TVC C  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT IRIS CONTROL CAUSING LOSS OF TVC C CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-780

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8281 ABORT: 3/3

ITEM: TVC D MONOCHROME LENS ASSY IRIS CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: TVC D  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE WOULD PREVENT IRIS CONTROL CAUSING LOSS OF TVC D CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-781

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8282 ABORT: 3/3

ITEM: TVC D MONOCHROME LENS ASSY IRIS CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: TVC D  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT IRIS CONTROL CAUSING LOSS OF TVC D CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-782

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8283 ABORT: 3/3

ITEM: RMS WRIST TVC MONOCHROME LENS ASSY IRIS CONTROL  
SWITCH

FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG

SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: RMS WRIST TVC

PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE WOULD PREVENT IRIS CONTROL CAUSING LOSS OF RMS WRIST TVC CAPABILITY. COULD RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-783

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8284 ABORT: 3/3

ITEM: RMS WRIST TVC MONOCHROME LENS ASSY IRIS CONTROL  
SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: RMS WRIST TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT IRIS CONTROL CAUSING LOSS OF RMS WRIST TVC CAPABILITY. COULD RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-784



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8285 ABORT: 3/3

ITEM: RMS ELBOW TVC MONOCHROME LENS ASSY IRIS CONTROL  
SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: RMS ELBOW  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE WOULD PREVENT IRIS CONTROL CAUSING LOSS OF RMS ELBOW TVC CAPABILITY. COULD RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-785

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8286 ABORT: 3/3

ITEM: RMS ELBOW TVC MONOCHROME LENS ASSY IRIS CONTROL  
SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: RMS ELBOW  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT IRIS CONTROL CAUSING LOSS OF RMS ELBOW TVC CAPABILITY. COULD RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-786

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8287 ABORT: 3/3

ITEM: FLT DECK TVC MONOCHROME LENS ASSY IRIS CONTROL  
SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE WOULD PREVENT IRIS CONTROL CAUSING LOSS OF FLT DECK TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-787

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8288 ABORT: 3/3

ITEM: FLT DECK TVC MONOCHROME LENS ASSY IRIS CONTROL  
SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT IRIS CONTROL CAUSING LOSS OF FLT DECK TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-788

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8289 ABORT: 3/3

ITEM: MID DECK TVC MONOCHROME LENS ASSY IRIS CONTROL  
SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE WOULD PREVENT IRIS CONTROL CAUSING LOSS OF MID DECK TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-789

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/17/87  
SUBSYSTEM: COMM AND TRACK  
MDAC ID: 8290

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: MID DECK TVC MONOCHROME LENS ASSY IRIS CONTROL  
SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) MONOCHROME LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT IRIS CONTROL CAUSING LOSS OF ID DECK TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-790

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8291 ABORT: 3/3

ITEM: FLT DECK TVC WIDE ANGLE LENS ASSY FOCUS CONTROL  
SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) WIDE ANGLE LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND OTHER LENS ASSY.) FAILURE TO SW WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF FLT DECK TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-791

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8292 ABORT: 3/3

ITEM: FLT DECK TVC WIDE ANGLE LENS ASSY FOCUS CONTROL  
SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) WIDE ANGLE LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF CABIN TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-792



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8293 ABORT: 3/3

ITEM: FLT DECK TVC WIDE ANGLE LENS ASSY ZOOM CONTROL  
SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) WIDE ANGLE LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND OTHER LENS ASSY.) FAILURE TO SW WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF CABIN TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-793

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8294 ABORT: 3/3

ITEM: FLT DECK TVC WIDE ANGLE LENS ASSY ZOOM CONTROL  
SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) WIDE ANGLE LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF CABIN TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-794

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8295 ABORT: 3/3

ITEM: FLT DECK TVC WIDE ANGLE LENS ASSY IRIS CONTROL  
SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) WIDE ANGLE LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND OTHER LENS ASSY.) FAILURE TO SW WOULD PREVENT IRIS CONTROL CAUSING LOSS OF CABIN TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-795

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8296 ABORT: 3/3

ITEM: FLT DECK TVC WIDE ANGLE LENS ASSY IRIS CONTROL  
SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) WIDE ANGLE LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT IRIS CONTROL CAUSING LOSS OF CABIN TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-796

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8297 ABORT: 3/3

ITEM: MID DECK TVC WIDE ANGLE LENS ASSY FOCUS CONTROL  
SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) WIDE ANGLE LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND OTHER LENS ASSY.) FAILURE TO SW WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF MID DECK TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-797

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8298 ABORT: 3/3

ITEM: MID DECK TVC WIDE ANGLE LENS ASSY FOCUS CONTROL  
SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) WIDE ANGLE LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF CABIN TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87

C-798

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8299 ABORT: 3/3

ITEM: MID DECK TVC WIDE ANGLE LENS ASSY ZOOM CONTROL  
SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) WIDE ANGLE LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND OTHER LENS ASSY.) FAILURE TO SW WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF MID DECK TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-799

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8300 ABORT: 3/3

ITEM: MID DECK TVC WIDE ANGLE LENS ASSY ZOOM CONTROL  
SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) WIDE ANGLE LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF CABIN TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-800



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8301 ABORT: 3/3

ITEM: MID DECK TVC WIDE ANGLE LENS ASSY IRIS CONTROL  
SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) WIDE ANGLE LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND OTHER LENS ASSY.) FAILURE TO SW WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF MID DECK TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-801

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8302 ABORT: 3/3

ITEM: MID DECK TVC WIDE ANGLE LENS ASSY IRIS CONTROL  
SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) WIDE ANGLE LENS
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORT WOULD PREVENT IRIS CONTROL CAUSING LOSS OF CABIN TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189. OMRSD NSTS 08171

REPORT DATE 12/31/87 C-802

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8303 ABORT: 3/3

ITEM: TVC A COLOR LENS ASSY FOCUS CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC A  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE TO SW WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF TVC A CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLE OPSMANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-803

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8304 ABORT: 3/3

ITEM: TVC A COLOR LENS ASSY FOCUS CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC A  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORTED SW WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF TVC CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPSMANUAL JSC-12770, OMRSD NSTS 08171, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189,

REPORT DATE 12/31/87

C-804

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8305 ABORT: 3/3

ITEM: TVC A COLOR LENS ASSY ZOOM CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC A  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE TO SW WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF TVC A CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLE OPSMANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-805

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8306 ABORT: 3/3

ITEM: TVC A COLOR LENS ASSY ZOOM CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC A  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORTED SW WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF TVC CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPSMANUAL JSC-12770, OMRSD NSTS 08171, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189,

REPORT DATE 12/31/87

C-806

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8307 ABORT: 3/3

ITEM: TVC A COLOR LENS ASSY IRIS CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC A  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE TO SW WOULD PREVENT IRIS CONTROL CAUSING LOSS OF TVC A CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLE OPSMANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-807

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8308 ABORT: 3/3

ITEM: TVC A COLOR LENS ASSY IRIS CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC A  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORTED SW WOULD PREVENT IRIS CONTROL CAUSING LOSS OF TVC CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPSMANUAL JSC-12770, OMRSD NSTS 08171, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189,

REPORT DATE 12/31/87

C-808



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8309 ABORT: 3/3

ITEM: TVC B COLOR LENS ASSY FOCUS CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC B  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE TO SW WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF TVC B CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLE OPSMANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-809

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8310 ABORT: 3/3

ITEM: TVC B COLOR LENS ASSY FOCUS CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC B  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORTED SW WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF TVC CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPSMANUAL JSC-12770, OMRSD NSTS 08171, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189,

REPORT DATE 12/31/87

C-810

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8311 ABORT: 3/3

ITEM: TVC B COLOR LENS ASSY ZOOM CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	2/1R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC B  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE TO SW WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF TVC B CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLE OPSMANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-811

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8312 ABORT: 3/3

ITEM: TVC B COLOR LENS ASSY ZOOM CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC B  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORTED SW WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF TVC CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPSMANUAL JSC-12770, OMRSD NSTS 08171, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189,

REPORT DATE 12/31/87

C-812

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8313 ABORT: 3/3

ITEM: TVC B COLOR LENS ASSY IRIS CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC B  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE TO SW WOULD PREVENT IRIS CONTROL CAUSING LOSS OF TVC B CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLE OPSMANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-813

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8314 ABORT: 3/3

ITEM: TVC B COLOR LENS ASSY IRIS CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC B  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORTED SW WOULD PREVENT IRIS CONTROL CAUSING LOSS OF TVC CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPSMANUAL JSC-12770, OMRSD NSTS 08171, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189,

REPORT DATE 12/31/87

C-814

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8315 ABORT: 3/3

ITEM: TVC C COLOR LENS ASSY FOCUS CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC C  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE TO SW WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF TVC C CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLE OPSMANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-815

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8316 ABORT: 3/3

ITEM: TVC C COLOR LENS ASSY FOCUS CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC C  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORTED SW WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF TVC CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPSMANUAL JSC-12770, OMRSD NSTS 08171, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189,

REPORT DATE 12/31/87

C-816



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8317 ABORT: 3/3

ITEM: TVC C COLOR LENS ASSY ZOOM CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC C  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE TO SW WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF TVC C CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLE OPSMANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-817

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8318 ABORT: 3/3

ITEM: TVC C COLOR LENS ASSY ZOOM CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC C  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORTED SW WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF TVC CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPSMANUAL JSC-12770, OMRSD NSTS 08171, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189,

REPORT DATE 12/31/87 C-818

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8319 ABORT: 3/3

ITEM: TVC C COLOR LENS ASSY IRIS CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC C  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE TO SW WOULD PREVENT IRIS CONTROL CAUSING LOSS OF TVC C CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLE OPSMANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-819

C-10

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK , FLIGHT: 2/1R  
MDAC ID: 8320 ABORT: 3/3

ITEM: TVC C COLOR LENS ASSY IRIS CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC C  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORTED SW WOULD PREVENT IRIS CONTROL CAUSING LOSS OF TVC CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPSMANUAL JSC-12770, OMRSD NSTS 08171, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189,

REPORT DATE 12/31/87

C-820

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8321 ABORT: 3/3

ITEM: TVC D COLOR LENS ASSY FOCUS CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC D  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE TO SW WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF TVC AD CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLE OPSMANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-821

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8322 ABORT: 3/3

ITEM: TVC D COLOR LENS ASSY FOCUS CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC D  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORTED SW WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF TVC CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPSMANUAL JSC-12770, OMRSD NSTS 08171, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189,

REPORT DATE 12/31/87

C-822

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8323 ABORT: 3/3

ITEM: TVC D COLOR LENS ASSY ZOOM CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC D  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE TO SW WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF TVC AD CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLE OPSMANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-823

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8324 ABORT: 3/3

ITEM: TVC D COLOR LENS ASSY ZOOM CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC D  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORTED SW WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF TVC CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPSMANUAL JSC-12770, OMRSD NSTS 08171, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189,

REPORT DATE 12/31/87

C-824



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8325 ABORT: 3/3

ITEM: TVC D COLOR LENS ASSY IRIS CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC D  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE TO SW WOULD PREVENT IRIS CONTROL CAUSING LOSS OF TVC AD CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLE OPSMANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-825

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8326 ABORT: 3/3

ITEM: TVC D COLOR LENS ASSY IRIS CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: TVC D  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORTED SW WOULD PREVENT IRIS CONTROL CAUSING LOSS OF TVC CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPSMANUAL JSC-12770, OMRSD NSTS 08171, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189,

REPORT DATE 12/31/87

C-826

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8327 ABORT: 3/3

ITEM: RMS WRIST TVC COLOR LENS ASSY FOCUS CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: RMS WRIST TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE TO SW WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF RMS WRIST TVC CAPABILITY. COULD RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLE OPSMANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-827

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8328 ABORT: 3/3

ITEM: RMS WRIST TVC COLOR LENS ASSY FOCUS CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: RMS WRIST TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORTED SW WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF TVC CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPSMANUAL JSC-12770, OMRSD NSTS 08171, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189,

REPORT DATE 12/31/87

C-828

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8329 ABORT: 3/3

ITEM: RMS WRIST TVC COLOR LENS ASSY ZOOM CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: RMS WRIST TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE TO SW WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF RMS WRIST TVC CAPABILITY. COULD RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLE OPSMANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-829

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8330 ABORT: 3/3

ITEM: RMS WRIST TVC COLOR LENS ASSY ZOOM CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: RMS WRIST TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORTED SW WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF TVC CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPSMANUAL JSC-12770, OMRSD NSTS 08171, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189,

REPORT DATE 12/31/87

C-830

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8331 ABORT: 3/3

ITEM: RMS WRIST TVC COLOR LENS ASSY IRIS CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: RMS WRIST TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE TO SW WOULD PREVENT IRIS CONTROL CAUSING LOSS OF RMS WRIST TVC CAPABILITY. COULD RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLE OPSMANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-831

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8332 ABORT: 3/3

ITEM: RMS WRIST TVC COLOR LENS ASSY IRIS CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: RMS WRIST TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORTED SW WOULD PREVENT IRIS CONTROL CAUSING LOSS OF TVC CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPSMANUAL JSC-12770, OMRSD NSTS 08171, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189,

REPORT DATE 12/31/87

C-832



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8333 ABORT: 3/3

ITEM: RMS ELBOW TVC COLOR LENS ASSY FOCUS CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: RMS ELBOW TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE TO SW WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF RMS ELBOW TVC CAPABILITY. COULD RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLE OPSMANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-833

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8334 ABORT: 3/3

ITEM: RMS ELBOW TVC COLOR LENS ASSY FOCUS CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: RMS ELBOW TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND. STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORTED SW WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF TVC CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPSMANUAL JSC-12770, OMRSD NSTS 08171, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189,

REPORT DATE 12/31/87

C-834

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8335 ABORT: 3/3

ITEM: RMS ELBOW TVC COLOR LENS ASSY ZOOM CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: RMS ELBOW TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE TO SW WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF RMS ELBOW TVC CAPABILITY. COULD RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLE OPSMANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-835

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8336 ABORT: 3/3

ITEM: RMS ELBOW TVC COLOR LENS ASSY ZOOM CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: RMS ELBOW TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORTED SW WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF TVC CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPSMANUAL JSC-12770, OMRSD NSTS 08171, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189,

REPORT DATE 12/31/87

C-836

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8337 ABORT: 3/3

ITEM: RMS ELBOW TVC COLOR LENS ASSY IRIS CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: RMS ELBOW TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP. OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE TO SW WOULD PREVENT IRIS CONTROL CAUSING LOSS OF RMS ELBOW TVC CAPABILITY. COULD RESULT IN LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLE OPSMANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-837

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 8338 ABORT: 3/3

ITEM: RMS ELBOW TVC COLOR LENS ASSY IRIS CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: RMS ELBOW TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORTED SW WOULD PREVENT IRIS CONTROL CAUSING LOSS OF TVC CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPSMANUAL JSC-12770, OMRSD NSTS 08171, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189,

REPORT DATE 12/31/87 C-838

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8339 ABORT: 3/3

ITEM: FLT DECK TVC COLOR LENS ASSY FOCUS CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE TO SW WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF FLT DECK TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLE OPSMANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-839

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8340 ABORT: 3/3

ITEM: FLT DECK TVC COLOR LENS ASSY FOCUS CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORTED SW WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF TVC CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPSMANUAL JSC-12770, OMRSD NSTS 08171, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189,

REPORT DATE 12/31/87

C-840



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8341 ABORT: 3/3

ITEM: FLT DECK TVC COLOR LENS ASSY ZOOM CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE TO SW WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF FLT DECK TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLE OPSMANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-841

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8342 ABORT: 3/3

ITEM: FLT DECK TVC COLOR LENS ASSY ZOOM CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORTED SW WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF TVC CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPSMANUAL JSC-12770, OMRSD NSTS 08171, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189,

REPORT DATE 12/31/87

C-842

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8343 ABORT: 3/3

ITEM: FLT DECK TVC COLOR LENS ASSY IRIS CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE TO SW WOULD PREVENT IRIS CONTROL CAUSING LOSS OF FLT DECK TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLE OPSMANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-843

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8344 ABORT: 3/3

ITEM: FLT DECK TVC COLOR LENS ASSY IRIS CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FLT DECK TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORTED SW WOULD PREVENT IRIS CONTROL CAUSING LOSS OF TVC CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPSMANUAL JSC-12770, OMRSD NSTS 08171, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189,

REPORT DATE 12/31/87

C-844

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8345 ABORT: 3/3

ITEM: MID DECK TVC COLOR LENS ASSY FOCUS CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE TO SW WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF MID DECK TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLE OPSMANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-845

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8346 ABORT: 3/3

ITEM: MID DECK TVC COLOR LENS ASSY FOCUS CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, FOCUS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORTED SW WOULD PREVENT FOCUS CONTROL CAUSING LOSS OF TVC CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPSMANUAL JSC-12770, OMRSD NSTS 08171, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189,

REPORT DATE 12/31/87

C-846

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8347 ABORT: 3/3

ITEM: MID DECK TVC COLOR LENS ASSY ZOOM CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE TO SW WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF MID DECK TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLE OPSMANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-847

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8348 ABORT: 3/3

ITEM: MID DECK TVC COLOR LENS ASSY ZOOM CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, ZOOM SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORTED SW WOULD PREVENT ZOOM CONTROL CAUSING LOSS OF TVC CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPSMANUAL JSC-12770, OMRSD, NSTS 08171, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189,

REPORT DATE 12/31/87

C-848



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8349 ABORT: 3/3

ITEM: MID DECK TVC COLOR LENS ASSY IRIS CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) FAILURE TO SW WOULD PREVENT IRIS CONTROL CAUSING LOSS OF MID DECK TVC CAPABILITY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLE OPSMANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-849

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8350 ABORT: 3/3

ITEM: MID DECK TVC COLOR LENS ASSY IRIS CONTROL SWITCH  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC)
- 4) COLOR LENS ASSY
- 5) FOCUS SW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK TVC  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP, AND SW VIA REMOTE GND CMD, IRIS SW LOCATED ON PANEL A7A1 AND LENS ASSY.) SHORTED SW WOULD PREVENT IRIS CONTROL CAUSING LOSS OF TVC CAPABILITY. COULD RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPSMANUAL JSC-12770, OMRSD NSTS 08171, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189,

REPORT DATE 12/31/87

C-850

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8351 ABORT: 3/3

ITEM: FLT DECK VIEWFINDER MONITOR PWR SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIEWFINDER MONITOR
- 4) PWR SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: VIEW FINDER  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE VIEWFINDER MONITOR USED WITH FLT DECK TV CAMERAS FOR SETUP AND ADJUSTMENTS. FAILURE WOULD MAKE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN LOST OF CABIN AND OUT THE WINDOW SCENES. LOSS OF LIKE AND UNLIKE REDUND. WOULD NOT CAUSE LOSS OF MISSION. (LIKE REDUND, MID DECK VIEWFINDER, AND UNLIKE VIA TWO CONSOLE MONITORS IN AFT CABIN AND MONITORS ON THE GROUND.) FAILURE TO SW PWR "ON" LOSES VIEWFINDER CAPABILITY. NOT CAUSE FOR LOSS OF CCTV OR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-851

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8352 ABORT: 3/3

ITEM: FLT DECK VIEWFINDER MONITOR PWR SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIEWFINDER MONITOR
- 4) PWR SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: VIEWFINDER MONITOR  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. VIEWFINDER MONITOR USED WITH FLT DECK TV CAMERA FOR SETUP AND ADJUSTMENTS. FAILURE WOULD MAKE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN LOST OF FLT DECK AND OUT THE WINDOW SCENES. LOSS OF LIKE AND UNLIKE REDUND WOULD NOT CAUSE LOSS OF MISSION. (LIKE REDUND, MID DECK VIEWFINDER, AND UNLIKE VIA TWO CONSOLE MONITORS IN AFT CABIN AND MONITORS ON THE GROUND.) SHORTED/OPEN SW PREVENTS PWR "ON" SELECTION AND LOSES VIEWFINDER CAPABILITY. NOT CAUSE FOR LOSS OF CCTV OR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-852

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8353 ABORT: 3/3

ITEM: MID DECK VIEWFINDER MONITOR PWR SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIEWFINDER MONITOR
- 4) PWR SW
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: VIEWFINDER MONITOR  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE VIEWFINDER MONITOR USED WITH MID DECK TV CAMERA FOR SETUP AND ADJUSTMENTS. FAILURE WOULD MAKE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN LOST OF CABIN SCENES. LOSS OF LIKE AND UNLIKE REDUND. WOULD NOT CAUSE LOSS OF MISSION. (LIKE REDUND, FLT DECK VIEWFINDER, AND UNLIKE VIA TWO CONSOLE MONITORS IN AFT CABIN AND MONITORS ON THE GROUND.) FAILURE TO SW PWR "ON" LOSES VIEWFINDER CAPABILITY. NOT CAUSE FOR LOSS OF CCTV OR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-853

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8354 ABORT: 3/3

ITEM: MID DECK VIEWFINDER MONITOR PWR SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIEWFINDER MONITOR
- 4) PWR SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: VIEWFINDER MONITOR  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. VIEWFINDER MONITOR USED WITH MID DECK TV CAMERA FOR SETUP AND ADJUSTMENTS. FAILURE WOULD MAKE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN LOST OF MID DECK SCENES. LOSS OF LIKE AND UNLIKE REDUND WOULD NOT CAUSE LOSS OF MISSION. (LIKE REDUND, FLT DECK VIEWFINDER, AND UNLIKE VIA TWO CONSOLE MONITORS IN AFT CABIN AND MONITORS ON THE GROUND.) SHORTED/OPEN SW PREVENTS PWR "ON" SELECTION AND LOSES VIEWFINDER CAPABILITY. NOT CAUSE FOR LOSS OF CCTV OR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-854

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8355 ABORT: 3/3

ITEM: FLT DECK VIEWFINDER MONITOR PEAK SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIEWFINDER MONITOR
- 4) PEAK SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: VIEWFINDER MONITOR  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. VIEWFINDER MONITOR USED WITH FLT DECK TV CAMERA FOR SETUP AND ADJUSTMENTS. FAILURE WOULD MAKE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN LOST OF FLT DECK AND OUT THE WINDOW SCENES. LOSS OF LIKE AND UNLIKE REDUND WOULD NOT CAUSE LOSS OF MISSION. (LIKE REDUND, MID DECK VIEWFINDER, AND UNLIKE VIA TWO CONSOLE MONITORS IN AFT CABIN AND MONITORS ON THE GROUND.) FAILURE TO SW PREVENTS SELECTION OF PEAK CONTRAST THUS REDUCING CAPABILITY TO ENHANCE SCENES. NOT CAUSE FOR LOSS OF CCTV OR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-855

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8356 ABORT: 3/3

ITEM: FLT DECK VIEWFINDER MONITOR PEAK SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIEWFINDER MONITOR
- 4) PEAK SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: VIEWFINDER MONITOR  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. VIEWFINDER MONITOR USED WITH FLT DECK TV CAMERA FOR SETUP AND ADJUSTMENTS. FAILURE WOULD MAKE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN LOST OF FLT DECK AND OUT THE WINDOW SCENES. LOSS OF LIKE AND UNLIKE REDUND WOULD NOT CAUSE LOSS OF MISSION. (LIKE REDUND, MID DECK VIEWFINDER, AND UNLIKE VIA TWO CONSOLE MONITORS IN AFT CABIN AND MONITORS ON THE GROUND.) SHORTED/OPEN SW PREVENTS SELECTION OF PEAK CONTRAST THUS REDUCING CAPABILITY TO ENHANCE SCENES. NOT CAUSE FOR LOSS OF CCTV OR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-856



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8357 ABORT: 3/3

ITEM: MID DECK VIEWFINDER MONITOR PEAK SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIEWFINDER MONITOR
- 4) PEAK SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: VIEWFINDER MONITOR  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. VIEWFINDER MONITOR USED WITH MID DECK TV CAMERA FOR SETUP AND ADJUSTMENTS. FAILURE WOULD MAKE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN LOST OF MID DECK SCENES. LOSS OF LIKE AND UNLIKE REDUND WOULD NOT CAUSE LOSS OF MISSION. (LIKE REDUND, FLT DECK VIEWFINDER, AND UNLIKE VIA TWO CONSOLE MONITORS IN AFT CABIN AND MONITORS ON THE GROUND.) FAILURE TO SW PREVENTS SELECTION OF PEAK CONTRAST THUS REDUCING CAPABILITY TO ENHANCE SCENES. NOT CAUSE FOR LOSS OF CCTV OR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-857

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8358 ABORT: 3/3

ITEM: MID DECK VIEWFINDER MONITOR PEAK SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIEWFINDER MONITOR
- 4) PEAK SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: VIEWFINDER MONITOR  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. VIEWFINDER MONITOR USED WITH MID DECK TV CAMERA FOR SETUP AND ADJUSTMENTS. FAILURE WOULD MAKE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN LOST OF MID DECK SCENES. LOSS OF LIKE AND UNLIKE REDUND WOULD NOT CAUSE LOSS OF MISSION. (LIKE REDUND, FLT DECK VIEWFINDER, AND UNLIKE VIA TWO CONSOLE MONITORS IN AFT CABIN AND MONITORS ON THE GROUND.) SHORTED/OPEN SW PREVENTS SELECTION OF PEAK CONTRAST THUS REDUCING CAPABILITY TO ENHANCE SCENES. NOT CAUSE FOR LOSS OF CCTV OR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-858

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8359 ABORT: 3/3

ITEM: FLT DECK VIEWFINDER MONITOR BRIGHTNESS AND  
CONTRAST CONTROL SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIEWFINDER MONITOR
- 4) BRIGHTNESS AND CONTRAST SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: VIEWFINDER MONITOR  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. VIEWFINDER MONITOR USED WITH FLT DECK TV CAMERA FOR SETUP AND ADJUSTMENTS. FAILURE WOULD MAKE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN LOST OF FLT DECK AND OUT THE WINDOW SCENES. LOSS OF LIKE AND UNLIKE REDUND WOULD NOT CAUSE LOSS OF MISSION. (LIKE REDUND, MID DECK VIEWFINDER, AND UNLIKE VIA TWO CONSOLE MONITORS IN AFT CABIN AND MONITORS ON THE GROUND.) FAILURE TO SW PREVENTS BRIGHTNESS AND CONTRAST CONTROL THUS REDUCING CAPABILITY TO ENHANCE SCENES. NOT CAUSE FOR LOSS OF CCTV OR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-859

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8360 ABORT: 3/3

ITEM: FLT DECK VIEWFINDER MONITOR BRIGHTNESS AND  
CONTRAST CONTROL SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIEWFINDER MONITOR
- 4) BRIGHTNESS AND CONTRAST SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: VIEWFINDER MONITOR

PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. VIEWFINDER MONITOR USED WITH FLT DECK TV CAMERA FOR SETUP AND ADJUSTMENTS. FAILURE WOULD MAKE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN LOST OF FLT DECK AND OUT THE WINDOW SCENES. LOSS OF LIKE AND UNLIKE REDUND WOULD NOT CAUSE LOSS OF MISSION. (LIKE REDUND, MID DECK VIEWFINDER, AND UNLIKE VIA TWO CONSOLE MONITORS IN AFT CABIN AND MONITORS ON THE GROUND.) OPEN/SHORT RESULTS IN LOSS OF PICTURE/SCENE DISPLAY VIA VIEWFINDER. NOT CAUSE FOR LOSS OF CCTV OR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-860

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8361 ABORT: 3/3

ITEM: MID DECK VIEWFINDER MONITOR BRIGHTNESS AND  
CONTRAST CONTROL SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIEWFINDER MONITOR
- 4) BRIGHTNESS AND CONTRAST SW
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: VIEWFINDER MONITOR

PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. VIEWFINDER MONITOR USED WITH MID DECK TV CAMERA FOR SETUP AND ADJUSTMENTS. FAILURE WOULD MAKE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN LOST OF MID DECK SCENES. LOSS OF LIKE AND UNLIKE REDUND WOULD NOT CAUSE LOSS OF MISSION. (LIKE REDUND, FLT DECK VIEWFINDER, AND UNLIKE VIA TWO CONSOLE MONITORS IN AFT CABIN AND MONITORS ON THE GROUND.) FAILURE TO SW PREVENTS BRIGHTNESS AND CONTRAST CONTROL THUS REDUCING CAPABILITY TO ENHANCE SCENES. NOT CAUSE FOR LOSS OF CCTV OR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-861

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8362 ABORT: 3/3

ITEM: MID DECK VIEWFINDER MONITOR BRIGHTNESS AND  
CONTRAST CONTROL SW  
FAILURE MODE: ELECTRICAL OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIEWFINDER MONITOR
- 4) BRIGHTNESS AND CONTRAST SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: VIEWFINDER MONITOR  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. VIEWFINDER MONITOR USED WITH MID DECK TV CAMERA FOR SETUP AND ADJUSTMENTS. FAILURE WOULD MAKE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN LOST OF MID DECK SCENES. LOSS OF LIKE AND UNLIKE REDUND WOULD NOT CAUSE LOSS OF MISSION. (LIKE REDUND, FLT DECK VIEWFINDER, AND UNLIKE VIA TWO CONSOLE MONITORS IN AFT CABIN AND MONITORS ON THE GROUND.) OPEN/SHORT RESULTS IN LOSS OF PICTURE/SCENE DISPLAY VIA VIEWFINDER. NOT CAUSE FOR LOSS OF CCTV OR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-862

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8363 ABORT: 3/3

ITEM: CONSOLE MONITOR PWR SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) CONSOLE MONITOR
- 4) PWR SW
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A3  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE TV CONSOLE MONITOR PROVIDES CAP TO VIEW SCENES FROM ALL TV CAMERA (TVC) AND VCR OUTPUTS. LOSS OF ALL CAP TO OBTAIN DISPLAYS OF TVC SCENES VIA LIKE OR UNLIKE REDUND WOULD MAKE TVC POINTING AND PICTURE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW. (LIKE REDUND, A SECOND CON MON AND SW, AND UNLIKE VIA MONS LOCATED ON THE GND AND VIEWFINDER MON FOR CABIN CAM ONLY. NO GPC CMD.) PWR SW CONTROLS PWR TO MON. FAILURE TO SW WOULD CAUSE LOSS OF MON CAP AND POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-863

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8364 ABORT: 3/3

ITEM: CONSOLE MONITOR PWR SW  
FAILURE MODE: OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) CONSOLE MONITOR
- 4) PWR SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A3  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE TV CONSOLE MONITOR PROVIDES CAP TO VIEW SCENES FROM ALL TV CAMERA (TVC) AND VCR OUTPUTS. LOSS OF ALL CAP TO OBTAIN DISPLAYS OF TVC SCENES VIA LIKE OR UNLIKE REDUND WOULD MAKE TVC POINTING AND PICTURE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW. (LIKE REDUND, A SECOND CON MON AND SW, AND UNLIKE VIA MONS LOCATED ON THE GND AND VIEWFINDER MON FOR CABIN CAM ONLY. NO GPC CMD.) PWR SW CONTROLS PWR TO MON. OPEN/SHORT SW WOULD CAUSE LOSS OF MON CAP AND POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-864



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/19/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK , FLIGHT: 3/3  
MDAC ID: 8365 ABORT: 3/3

ITEM: CONSOLE MONITOR X-HAIR SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) CONSOLE MONITOR
- 4) X-HAIR SW
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A3  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE TV CONSOLE MONITOR PROVIDES CAP TO VIEW SCENES FROM ALL TV CAMERA (TVC) AND VCR OUTPUTS. LOSS OF ALL CAP TO OBTAIN DISPLAYS OF TVC SCENES VIA LIKE OR UNLIKE REDUND. WOULD MAKE TVC POINTING AND PICTURE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW. (LIKE REDUND, A SECOND CON MON AND SW, AND UNLIKE VIA MONS LOCATED ON THE GND AND VIEWFINDER MON FOR CABIN CAM ONLY. NO GPC CMD.) FAILURE OF X-HAIR SW WOULD CAUSE LOSS OF MON CROSSHAIR REF. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-865

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/19/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8366 ABORT: 3/3

ITEM: CONSOLE MONITOR X-HAIR SW  
FAILURE MODE: OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) CONSOLE MONITOR
- 4) X-HAIR SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A3  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE TV CONSOLE MONITOR PROVIDES CAP TO VIEW SCENES FROM ALL TV CAMERA (TVC) AND VCR OUTPUTS. LOSS OF ALL CAP TO OBTAIN DISPLAYS OF TVC SCENES VIA LIKE OR UNLIKE REDUND. WOULD MAKE TVC POINTING AND PICTURE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW. (LIKE REDUND, A SECOND CON MON AND SW, AND UNLIKE VIA MONS LOCATED ON THE GND AND VIEWFINDER MON FOR CABIN CAM ONLY. NO GPC CMD.) OPEN/SHORTED X-HAIR SW WOULD CAUSE LOSS OF MON CROSSHAIR REF. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-866

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/19/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8367 ABORT: 3/3

ITEM: CONSOLE MONITOR SYNC SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) CONSOLE MONITOR
- 4) SYNC SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A3  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE TV CONSOLE MONITOR PROVIDES CAP TO VIEW SCENES FROM ALL TV CAMERA (TVC) AND VCR OUTPUTS. LOSS OF ALL CAP TO OBTAIN DISPLAYS OF TVC SCENES VIA LIKE OR UNLIKE REDUND. WOULD MAKE TVC POINTING AND PICTURE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW. (LIKE REDUND, A SECOND CON MON AND SW, AND UNLIKE VIA MONS LOCATED ON THE GND AND VIEWFINDER MON FOR CABIN CAM ONLY. NO GPC CMD.) FAILURE TO SW WOULD PREVENT SELECTING BETWEEN EXT OR INT MONITOR SYNC. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-867

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/19/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8368 ABORT: 3/3

ITEM: CONSOLE MONITOR SYNC SW  
FAILURE MODE: OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) CONSOLE MONITOR
- 4) SYNC SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A3  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE TV CONSOLE MONITOR PROVIDES CAP TO VIEW SCENES FROM ALL TV CAMERA (TVC) AND VCR OUTPUTS. LOSS OF ALL CAP TO OBTAIN DISPLAYS OF TVC SCENES VIA LIKE OR UNLIKE REDUND. WOULD MAKE TVC POINTING AND PICTURE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW. (LIKE REDUND, A SECOND CON MON AND SW, AND UNLIKE VIA MONS LOCATED ON THE GND AND VIEWFINDER MON FOR CABIN CAM ONLY. NO GPC CMD.) OPEN/SHORT WOULD CAUSE LOSS OF SYNC AND MON CAP WITH POSSIBLE LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-868

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/19/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8369 ABORT: 3/3

ITEM: CONSOLE MONITOR DATA SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) CONSOLE MONITOR
- 4) DATA SW
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A3  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE TV CONSOLE MONITOR PROVIDES CAP TO VIEW SCENES FROM ALL TV CAMERA (TVC) AND VCR OUTPUTS. LOSS OF ALL CAP TO OBTAIN DISPLAYS OF TVC SCENES VIA LIKE OR UNLIKE REDUND. WOULD MAKE TVC POINTING AND PICTURE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW. (LIKE REDUND, A SECOND CON MON AND SW, AND UNLIKE VIA MONS LOCATED ON THE GND AND VIEWFINDER MON FOR CABIN CAM ONLY. NO GPC CMD.) FAILURE TO SW WOULD CAUSE LOSS OF DATA STATUS DISPLAY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-869

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/19/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8370 ABORT: 3/3

ITEM: CONSOLE MONITOR DATA SW  
FAILURE MODE: OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) CONSOLE MONITOR
- 4) DATA SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A3  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE TV CONSOLE MONITOR PROVIDES CAP TO VIEW SCENES FROM ALL TV CAMERA (TVC) AND VCR OUTPUTS. LOSS OF ALL CAP TO OBTAIN DISPLAYS OF TVC SCENES VIA LIKE OR UNLIKE REDUND. WOULD MAKE TVC POINTING AND PICTURE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW. (LIKE REDUND, A SECOND CON MON AND SW, AND UNLIKE VIA MONS LOCATED ON THE GND AND VIEWFINDER MON FOR CABIN CAM ONLY. NO GPC CMD.) OPEN/SHORT WOULD CAUSE LOSS OF DATA STATUS DISPLAY. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-870

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/19/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8371 ABORT: 3/3

ITEM: CONSOLE MONITOR SCAN SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) CONSOLE MONITOR
- 4) SCAN SW
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A3  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE TV CONSOLE MONITOR PROVIDES CAP TO VIEW SCENES FROM ALL TV CAMERA (TVC) AND VCR OUTPUTS. LOSS OF ALL CAP TO OBTAIN DISPLAYS OF TVC SCENES VIA LIKE OR UNLIKE REDUND WOULD MAKE TVC POINTING AND PICTURE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW. (LIKE REDUND, A SECOND CON MON AND SW, AND UNLIKE VIA MONS LOCATED ON THE GND AND VIEWFINDER MON FOR CABIN CAM ONLY. NO GPC CMD.) FAILURE WOULD CAUSE LOSS OF CAP TO SELECT DISPLAY FOR NORM OR VERT TEST PATTERN. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-871

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/19/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8372 ABORT: 3/3

ITEM: CONSOLE MONITOR SCAN SW  
FAILURE MODE: OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) CONSOLE MONITOR
- 4) SCAN SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A3  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE TV CONSOLE MONITOR PROVIDES CAP TO VIEW SCENES FROM ALL TV CAMERA (TVC) AND VCR OUTPUTS. LOSS OF ALL CAP TO OBTAIN DISPLAYS OF TVC SCENES VIA LIKE OR UNLIKE REDUND. WOULD MAKE TVC POINTING AND PICTURE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW. (LIKE REDUND, A SECOND CON MON AND SW, AND UNLIKE VIA MONS LOCATED ON THE GND AND VIEWFINDER MON FOR CABIN CAM ONLY. NO GPC CMD.) OPEN/SHORT WOULD CAUSE LOSS OF CAP TO SELECT DISPLAY FOR NORM OR VERT TEST PAT. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-872



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8373 ABORT: 3/3

ITEM: CONSOLE MONITOR SOURCE SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) CONSOLE MONITOR
- 4) SOURCE SW
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A3  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE TV CONSOLE MONITOR PROVIDES CAP TO VIEW SCENES FROM ALL TV CAMERA (TVC) AND VCR OUTPUTS. LOSS OF ALL CAP TO OBTAIN DISPLAYS OF TVC SCENES VIA LIKE OR UNLIKE REDUND. WOULD MAKE TVC POINTING AND PICTURE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW. (LIKE REDUND, A SECOND CON MON AND SW, AND UNLIKE VIA MONS LOCATED ON THE GND AND VIEWFINDER MON FOR CABIN CAM ONLY. NO GPC CMD.) SW SELECTS SIG TO BE DISPLAYED ON MON FROM PANEL OR DOWNLINK. FAILURE NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-873

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8374 ABORT: 3/3

ITEM: CONSOLE MONITOR SOURCE SW  
FAILURE MODE: OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) CONSOLE MONITOR
- 4) SOURCE SW
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A3  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE TV CONSOLE MONITOR PROVIDES CAP TO VIEW SCENES FROM ALL TV CAMERA (TVC) AND VCR OUTPUTS. LOSS OF ALL CAP TO OBTAIN DISPLAYS OF TVC SCENES VIA LIKE OR UNLIKE REDUND. WOULD MAKE TVC POINTING AND PICTURE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW. (LIKE REDUND, A SECOND CON MON AND SW, AND UNLIKE VIA MONS ON THE GND AND VUFNDR MON FOR CABIN CAM ONLY. NO GPC CMD.) SW SELECTS SIG TO BE DISPLAYED ON MON. OPEN/SHORT WOULD PREVENT VIEWING SCENES ON MON. POSS LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-874

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 8375 ABORT: 3/3

ITEM: CONSOLE MONITOR BRIGHTNESS AND CONTRAST CONTROL SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) CONSOLE MONITOR
- 4) BRIGHTNESS AND CONTRAST SW
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL A3  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE TV CONSOLE MONITOR PROVIDES CAP TO VIEW SCENES FROM ALL TV CAMERA (TVC) AND VCR OUTPUTS. LOSS OF ALL CAP TO OBTAIN DISPLAYS OF TVC SCENES VIA LIKE OR UNLIKE REDUND. WOULD MAKE TVC POINTING AND PICTURE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW. (LIKE REDUND, SECOND CON MON AND SW, AND UNLIKE VIA MONS ON THE GND AND VUFINDER MON FOR CABIN CAM ONLY. NO GPC CMD.) FAILURE TO SW PREVENTS BRGHTNSS AND CNTRST CONTROL FOR NORMALIZATION OF MON SCENES. NO CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-875

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 8376 ABORT: 3/3

ITEM: CONSOLE MONITOR BRIGHTNESS AND CONTRAST CONTROL SW  
FAILURE MODE: OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) CONSOLE MONITOR
- 4) BRIGHTNESS AND CONTRAST SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL A3  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE TV CONSOLE MONITOR PROVIDES CAP TO VIEW SCENES FROM ALL TV CAMERA (TVC) AND VCR OUTPUTS. LOSS OF ALL CAP TO OBTAIN DISPLAYS OF TVC SCENES VIA LIKE OR UNLIKE REDUND. WOULD MAKE TVC POINTING AND PICTURE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW. (LIKE REDUND, SECOND CON MON AND SW, AND UNLIKE VIA MONS ON THE GND AND VUFINDER MON FOR CABIN CAM ONLY. NO GPC CMD.) OPEN/SHORT COULD CAUSE LOSS OF MONITOR DISPLAY CAP RESULTING IN LOSS OF VEHICLE AND CREW.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-876

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 2/1R  
MDAC ID: 8501 ABORT: 3/3

ITEM: RCU 3A CIRCUIT BREAKER (CB 37 & CB 42)  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIDEO CONTROL UNIT (VCU)
- 4) REMOTE CONTROL UNIT (RCU)
- 5) MNA AND MNB
- 6) CB 37 AND CB 42 (3A)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PNL 15:D  
PART NUMBER: CB 37 AND CB 42

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) RCU LRU PRIMARILY PROVIDES TV CAM (TVC) MASTER SYNC SIGNALS AND PROCESSES CCTV SYS CMDS. OPEN CB CAUSES LOSS OF RCU FUNCTIONS. DUAL REDUND CB BOTH NOR CLOSED FAILURE OF ONE NOT READILY DETECTABLE IN FLT.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-877

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 8502 ABORT: 3/3

ITEM: RCU 3A CIRCUIT BREAKER (CB 37 & CB 42)  
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIDEO CONTROL UNIT (VCU)
- 4) REMOTE CONTROL UNIT (RCU)
- 5) MNA AND MNB
- 6) CB 37 AND CB 42 (3A)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 15:D  
PART NUMBER: CB 37 AND CB 42

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) RCU LRU PRIMARILY PROVIDES TV CAM (TVC) MASTER SYNC SIGNALS AND PROCESSES CCTV SYS CMDS. DUAL REDUND CB BOTH NOR CLOSED, NO AFFECT ON MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-878

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 2/1R  
MDAC ID: 8503 ABORT: 3/3

ITEM: MON 3A CIRCUIT BREAKER (CB 38 & CB 43)  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) CONSOLE MONITOR 1 & 2
- 4) MN A AND MN B
- 5) CB 38 & CB 43 (3A)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PNL 15:D  
PART NUMBER: CB 38 AND CB 43

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE TV CONSOLE MONITOR PROVIDES CAP TO VIEW SCENES FROM ALL TV CAMERAS (TVC) AND VCR OUTPUTS. LOSS OF ALL CAPABILITY TO OBTAIN DISPLAYS OF TVC SCENES VIA LIKE OR UNLIKE REDUND. WOULD MAKE TVC POINTING AND PICTURE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN POSSIBLE LOSS OF CCTV COVERAGE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW. (LIKE REDUND, A SECOND CONSOLE MON, AND UNLIKE VIA MONS LOCATED ON THE GND. AND VIEWFINDER MONITOR FOR CABIN CAMERAS ONLY.) OPEN CB WOULD CAUSE LOSS OF ONE OF TWO MON.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-879

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 8504 ABORT: 3/3

ITEM: MON 3A CIRCUIT BREAKER (CB 38 & CB 43)  
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) CONSOLE MONITOR 1 AND 2
- 4) MNA AND MNB
- 5) CB 38 & CB 43 (3A)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 15:D  
PART NUMBER: CB 38 AND CB 43

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE TV CONSOLE MONITOR PROVIDES CAP TO VIEW SCENES FROM ALL TV CAMERAS (TVC) AND VCR OUTPUTS. LOSS OF ALL CAPABILITY TO OBTAIN DISPLAYS OF TVC SCENES VIA LIKE OR UNLIKE REDUND. WOULD MAKE TVC POINTING AND PICTURE ADJUSTMENTS DIFFICULT IF NOT IMPOSSIBLE RESULTING IN POSSIBLE LOSS OF CCTV COVERAGE RESULTING IN POSSIBLE LOSS OF VEHICLE AND CREW. (LIKE REDUND, A SECOND CONSOLE MON, AND UNLIKE VIA MONS LOCATED ON THE GND. AND VIEWFINDER MONITOR FOR CABIN CAMERAS ONLY.) CLOSED CB WOULD NOT CAUSE LOSS OF MON.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-880



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 2/1R  
MDAC ID: 8505 ABORT: 3/3

ITEM: CB 39 FWD BAY TVC & P/T (3A)  
FAILURE MODE: FAIL OPEN

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) / PAN & TILT (P/T)
- 4) MNB
- 5) CB 39
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PNL 15:D  
PART NUMBER: CB 39

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) OPEN CB WOULD CAUSE LOSS OF FWD BAY TVC & P/T FUNCTIONS.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-881

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 8506 ABORT: 3/3

ITEM: CB 39 FWD BAY TVC & P/T (3A)  
FAILURE MODE: FAIL CLOSED

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) / PAN & TILT (P/T)
- 4) MNB
- 5) CB 39
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 15:D  
PART NUMBER: CB 39

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) CLOSED CB WOULD NOT AFFECT FWD BAY TVC & P/T FUNCTIONS.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-882

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 2/1R  
MDAC ID: 8507 ABORT: 3/3

ITEM: CB 40 FWD BAY TVC HTR (3A)  
FAILURE MODE: FAIL OPEN

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) HTR
- 4) MNB
- 5) CB 40
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PNL 15:D  
PART NUMBER: CB 40

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) OPEN CB WOULD CAUSE HTR LOSS WITH POSSIBLE LOSS OF FWD BAY TVC FUNCTIONS DUE TO COLD TEMP.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-883

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 8508 ABORT: 3/3

ITEM: CB 40 FWD BAY TVC HTR (3A)  
FAILURE MODE: FAIL CLOSED

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) HTR
- 4) MNB
- 5) CB 40
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 15:D  
PART NUMBER: CB 40

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) CLOSED CB WOULD NOT AFFECT FWD BAY TVC FUNCTIONS CONSIDERING THERMOSTAT CONTROL OF HTR.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-884

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 2/1R  
MDAC ID: 8509 ABORT: 3/3

ITEM: CB 41 FWD BAY P/T HTR (3A)  
FAILURE MODE: FAIL OPEN

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) PAN AND TILT (P/T) HTR
- 4) MNB
- 5) CB 41
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PNL 15:D  
PART NUMBER: CB 41

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) OPEN CB WOULD CAUSE HTR LOSS  
WITH POSSIBLE LOSS OR SLUGISH OPERATION OF FWD BAY P/T FUNCTIONS  
DUE TO COLD TEMP.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-885

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 8510 ABORT: 3/3

ITEM: CB 41 FWD BAY P/T HTR (3A)  
FAILURE MODE: FAIL CLOSED

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) PAN AND TILT (P/T) HTR
- 4) MNB
- 5) CB 41
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 15:D  
PART NUMBER: CB 41

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) CLOSED CB WOULD NOT CAUSE LOSS OF FWD BAY P/T FUNCTIONS DUE TO THERMOSTAT CONTROL OF HTR.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-886

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 2/1R  
MDAC ID: 8511 ABORT: 3/3

ITEM: CB 34 AFT BAY TVC & P/T (3A)  
FAILURE MODE: FAIL OPEN

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) / PAN & TILT (P/T)
- 4) MNA
- 5) CB 34
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PNL 15:D  
PART NUMBER: CB 34

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) OPEN CB WOULD CAUSE LOSS OF AFT BAY TVC & P/T FUNCTIONS.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-887

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 8512 ABORT: 3/3

ITEM: CB 34 AFT BAY TVC & P/T (3A)  
FAILURE MODE: -FAIL CLOSED

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) / PAN & TILT (P/T)
- 4) MNA
- 5) CB 34
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 15:D  
PART NUMBER: CB 34

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) CLOSED CB WOULD NOT AFFECT AFT BAY TVC & P/T FUNCTIONS.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-888



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 2/1R  
MDAC ID: 8513 ABORT: 3/3

ITEM: CB 35 AFT BAY TVC HTR (3A)  
FAILURE MODE: FAIL OPEN

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) HTR
- 4) MNA
- 5) CB 35
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES	
FLIGHT PHASE	HDW/FUNC	ABORT
PRELAUNCH:	3/3	RTLS: 3/3
LIFTOFF:	3/3	TAL: 3/3
ONORBIT:	2/1R	AOA: 3/3
DEORBIT:	3/3	ATO: 3/3
LANDING/SAFING:	3/3	

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PNL 15:D  
PART NUMBER: CB 35

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) OPEN CB WOULD CAUSE HTR LOSS WITH POSSIBLE LOSS OF AFT BAY TVC FUNCTIONS DUE TO COLD TEMP.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-889

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 8514 ABORT: 3/3

ITEM: CB 35 AFT BAY TVC HTR (3A)  
FAILURE MODE: FAIL CLOSED

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) HTR
- 4) MNA
- 5) CB 35
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 15:D  
PART NUMBER: CB 35

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) CLOSED CB WOULD NOT AFFECT AFT BAY TVC FUNCTIONS CONSIDERING THERMOSTAT CONTROL OF HTR.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-890

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 2/1R  
MDAC ID: 8515 ABORT: 3/3

ITEM: CB 36 AFT BAY P/T HTR (3A)  
FAILURE MODE: FAIL OPEN

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) PAN AND TILT (P/T) HTR
- 4) MNA
- 5) CB 36
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PNL 15:D  
PART NUMBER: CB 36

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) OPEN CB WOULD CAUSE HTR LOSS WITH POSSIBLE LOSS OR SLUGISH OPERATION OF AFT BAY P/T FUNCTIONS DUE TO COLD TEMP.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-891

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 8516 ABORT: 3/3

ITEM: CB 36 AFT BAY P/T HTR (3A)  
FAILURE MODE: FAIL CLOSED

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) PAN AND TILT (P/T) HTR
- 4) MNA
- 5) CB 36
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 15:D  
PART NUMBER: CB 36

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) CLOSED CB WOULD NOT CAUSE LOSS OF AFT BAY P/T FUNCTIONS DUE TO THERMOSTAT CONTROL OF HTR.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-892

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 2/1R  
MDAC ID: 8517 ABORT: 3/3

ITEM: CB 45 KEEL/EVA TVC & P/T (3A)  
FAILURE MODE: FAIL OPEN

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) / PAN & TILT (P/T)
- 4) MNC
- 5) CB 45
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PNL 15:D  
PART NUMBER: CB 45

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) OPEN CB WOULD CAUSE LOSS OF KEEL/EVA TVC & P/T FUNCTIONS.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-893

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 8518 ABORT: 3/3

ITEM: CB 45 KEEL/EVA TVC & P/T (3A)  
FAILURE MODE: FAIL CLOSED

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) / PAN & TILT (P/T)
- 4) MNC
- 5) CB 45
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 15:D  
PART NUMBER: CB 45

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) CLOSED CB WOULD NOT AFFECT KEEL/EVA TVC & P/T FUNCTIONS.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-894

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 2/1R  
MDAC ID: 8519 ABORT: 3/3

ITEM: CB 46 KEEL/EVA TVC HTR (3A)  
FAILURE MODE: FAIL OPEN

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) HTR
- 4) MNC
- 5) CB 46
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PNL 15:D  
PART NUMBER: CB 46

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) OPEN CB WOULD CAUSE HTR LOSS WITH POSSIBLE LOSS OF KEEL/EVA TVC FUNCTIONS DUE TO COLD TEMP.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-895

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 8520 ABORT: 3/3

ITEM: CB 46 KEEL/EVA TVC HTR (3A)  
FAILURE MODE: FAIL CLOSED

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) HTR
- 4) MNC
- 5) CB 46
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 15:D  
PART NUMBER: CB 46

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) CLOSED CB WOULD NOT AFFECT KEEL/EVA TVC FUNCTIONS CONSIDERING THERMOSTAT CONTROL OF HTR.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-896



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 2/1R  
MDAC ID: 8521 ABORT: 3/3

ITEM: CB 47 KEEL/EVA P/T HTR (3A)  
FAILURE MODE: FAIL OPEN

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) PAN AND TILT (P/T) HTR
- 4) MNC
- 5) CB 47
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PNL 15:D  
PART NUMBER: CB 47

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) OPEN CB WOULD CAUSE HTR LOSS WITH POSSIBLE LOSS OR SLUGISH OPERATION OF KEEL/EVA P/T FUNCTIONS DUE TO COLD TEMP.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-897

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 8522 ABORT: 3/3

ITEM: CB 47 KEEL/EVA P/T HTR (3A)  
FAILURE MODE: FAIL CLOSED

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) PAN AND TILT (P/T) HTR
- 4) MNC
- 5) CB 47
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 15:D  
PART NUMBER: CB 47

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) CLOSED CB WOULD NOT CAUSE LOSS  
OF KEEL/EVA P/T FUNCTIONS DUE TO THERMOSTAT CONTROL OF HTR.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-898

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 8523 ABORT: 3/3

ITEM: CB 48 CABIN TVC (5A)  
FAILURE MODE: FAIL OPEN

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) FLT AND MID DECK
- 4) MNC
- 5) CB 48
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL R15:D  
PART NUMBER: CB 48

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND IVA CREW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) OPEN CB WOULD CAUSE LOSS OF IN CABIN FLT DECK AND MID DECK SCENES FOR TRANSMISSION TO GROUND. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-899

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 8524 ABORT: 3/3

ITEM: CB 48 CABIN TVC (5A)  
FAILURE MODE: FAIL CLOSED

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) FLT AND MID DECK
- 4) MNC
- 5) CB 48
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL R15:D  
PART NUMBER: CB 48

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND IVA CREW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) CLOSED CB WOULD NOT AFFECT IN CABIN FLT DECK AND MID DECK SCENES TVC OPERATIONS.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-900

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 2/1R  
MDAC ID: 8525 ABORT: 3/3

ITEM: CB 51 STBD RMS TVC & P/T (3A)  
FAILURE MODE: FAIL OPEN

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) / PAN & TILT (P/T)
- 4) MNA
- 5) CB 51
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PNL 15:E  
PART NUMBER: CB 51

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) OPEN CB WOULD CAUSE LOSS OF STBD RMS TVC & P/T FUNCTIONS.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-901

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 8526 ABORT: 3/3

ITEM: CB 51 STBD RMS TVC & P/T (3A)  
FAILURE MODE: FAIL CLOSED

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) / PAN & TILT (P/T)
- 4) MNA
- 5) CB 51
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 15:E  
PART NUMBER: CB 51

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) CLOSED CB WOULD NOT AFFECT STBD  
RMS TVC & P/T FUNCTIONS.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-902

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 2/1R  
MDAC ID: 8527 ABORT: 3/3

ITEM: CB 52 STBD RMS TVC HTR (3A)  
FAILURE MODE: FAIL OPEN

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) HTR
- 4) MNA
- 5) CB 52
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PNL 15:E  
PART NUMBER: CB 52

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) OPEN CB WOULD CAUSE HTR LOSS  
WITH POSSIBLE LOSS OF STBD RMS TVC FUNCTIONS DUE TO COLD TEMP.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-903

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 8528 ABORT: 3/3

ITEM: CB 52 STBD RMS TVC HTR (3A)  
FAILURE MODE: FAIL CLOSED

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) HTR
- 4) MNA
- 5) CB 52
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 15:E  
PART NUMBER: CB 52

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) CLOSED CB WOULD NOT AFFECT STBD RMS TVC FUNCTIONS CONSIDERING THERMOSTAT CONTROL OF HTR.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-904



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 2/1R  
MDAC ID: 8529 ABORT: 3/3

ITEM: CB 53 STBD RMS P/T HTR (3A)  
FAILURE MODE: FAIL OPEN

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) PAN AND TILT (P/T) HTR
- 4) MNA
- 5) CB 53
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATÓ:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PNL 15:E  
PART NUMBER: CB 53

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) OPEN CB WOULD CAUSE HTR LOSS  
WITH POSSIBLE LOSS OR SLUGISH OPERATION OF STBD RMS P/T FUNCTIONS  
DUE TO COLD TEMP.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-905

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 8530 ABORT: 3/3

ITEM: CB 53 STBD RMS P/T HTR (3A)  
FAILURE MODE: FAIL CLOSED

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) PAN AND TILT (P/T) HTR
- 4) MNA
- 5) CB 53
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 15:E.  
PART NUMBER: CB 53

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) CLOSED CB WOULD NOT CAUSE LOSS OF STBD RMS P/T FUNCTIONS DUE TO THERMOSTAT CONTROL OF HTR.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-906

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 2/1R  
MDAC ID: 8531 ABORT: 3/3

ITEM: CB 55 PORT RMS TVC & P/T (3A)  
FAILURE MODE: FAIL OPEN

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) / PAN & TILT (P/T)
- 4) MNB
- 5) CB 55
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PNL 15:E  
PART NUMBER: CB 55

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) OPEN CB WOULD CAUSE LOSS OF PORT  
RMS TVC & P/T FUNCTIONS.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-907

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 8532 ABORT: 3/3

ITEM: CB 55 PORT RMS TVC & P/T (3A)  
FAILURE MODE: FAIL CLOSED

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) / PAN & TILT (P/T)
- 4) MNB
- 5) CB 55
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 15:E  
PART NUMBER: CB 55

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) CLOSED CB WOULD NOT AFFECT PORT  
RMS TVC & P/T FUNCTIONS.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-908

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 2/1R  
MDAC ID: 8533 ABORT: 3/3

ITEM: CB 56 PORT RMS TVC HTR (3A)  
FAILURE MODE: FAIL OPEN

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) HTR
- 4) MNB
- 5) CB 56
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PNL 15:E  
PART NUMBER: CB 56

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) OPEN CB WOULD CAUSE HTR LOSS  
WITH POSSIBLE LOSS OF PORT RMS TVC FUNCTIONS DUE TO COLD TEMP.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-909

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 8534 ABORT: 3/3

ITEM: CB 56 PORT RMS TVC HTR (3A)  
FAILURE MODE: FAIL CLOSED

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) TV CAMERA (TVC) HTR
- 4) MNB
- 5) CB 56
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 15:E  
PART NUMBER: CB 56

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) CLOSED CB WOULD NOT AFFECT PORT RMS TVC FUNCTIONS CONSIDERING THERMOSTAT CONTROL OF HTR.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-910

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 2/1R  
MDAC ID: 8535 ABORT: 3/3

ITEM: CB 57 PORT RMS P/T HTR (3A)  
FAILURE MODE: FAIL OPEN

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) PAN AND TILT (P/T) HTR
- 4) MNB
- 5) CB 57
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	2/1R		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PNL 15:E  
PART NUMBER: CB 57

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV  
FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE  
PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF  
VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS  
JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND  
RADAR FOR RENDEZ AND STA/KEEP.) OPEN CB WOULD CAUSE HTR LOSS  
WITH POSSIBLE LOSS OR SLUGISH OPERATION OF PORT RMS P/T FUNCTIONS  
DUE TO COLD TEMP.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87 C-911

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 8536 ABORT: 3/3

ITEM: CB 57 PORT RMS P/T HTR (3A)  
FAILURE MODE: FAIL CLOSED

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) PAN AND TILT (P/T) HTR
- 4) MNB
- 5) CB 57
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL 15:E  
PART NUMBER: CB 57

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. LOSS OF ALL CAP TO OBTAIN CCTV FUNCTIONS VIA LIKE AND UNLIKE REDUND COULD IN THE WORST CASE PREVENT RMS STOW AND P/L BAY DOOR CLOSURE RESULTING IN LOSS OF VEHICLE AND CREW. (UNLIKE-REDUND CREW WINDOW VIEWING, RMS JETTISON, EVA AND COAS FOR CREW VISUAL INSPECTION AND KU BAND RADAR FOR RENDEZ AND STA/KEEP.) CLOSED CB WOULD NOT CAUSE LOSS OF PORT RMS P/T FUNCTIONS DUE TO THERMOSTAT CONTROL OF HTR.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-912



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 9001 ABORT: 3/3

ITEM: ACCU BYPASS  
FAILURE MODE: OPEN (ELECTRICAL), LOSS OF OUTPUT, SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CREW EQUIPMENT/COMM
- 3) ACCU BYPASS
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: FORWARD AVIONICS BAY  
PART NUMBER: SED16101900-301

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE

EFFECTS/RATIONALE:

THE ACCU BYPASS IS A DEVICE THAT CAN BE USED TO BYPASS EITHER OF THE REDUNDANT AUDIO CENTRAL CONTROL UNIT (ACCU) SETS, OR BOTH IN CASE OF TOTAL LOSS OF ACCU. THE BYPASS ACTION IS DONE BY AN IN-FLIGHT MAINTENANCE (IFM) PROCEDURE. LOSS OF ALL TWO-WAY VOICE COMM REQUIRES MISSION TERMINATION.

REFERENCES: SCHEMATIC DIAGRAM SED16101900-301; FLIGHT RULES JSC-12820, SECTION 11

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 9011 ABORT: 3/3

ITEM: HEADSET, VERY LIGHT WEIGHT  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CREW EQUIPMENT/COMM
- 3) VERY LIGHT WEIGHT HEADSET
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/2R	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: USED IN VARIOUS ORBITER LOCATIONS  
PART NUMBER: SED16101291-305, -309

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE,  
PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE: THE VERY LIGHT WEIGHT HEADSET IS USED BY CREW MEMBERS TO PROVIDE TWO-WAY VOICE COMM FOR INTERCOMM, WITH GROUND, AND WITH EVA CREW MEMBERS. LOSS OF A HEADSET WOULD NOT AFFECT MISSION OR ENDANGER CREW/VEHICLE. LOSS OF ALL CAPABILITY FOR VOICE COMM WOULD CAUSE MISSION ABORT.

REFERENCES: SCHEMATIC DIAGRAM SED16101291; JSC-12820 FLIGHT RULES, SECTION 11

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 9012 ABORT: 3/3

ITEM: COMM CARRIER ELECTRONICS MODULE  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CREW EQUIPMENT/COMM
- 3) COMM CARRIER
- 4) COMM CARRIER ELECTRONICS MODULE
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/2R	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: USED IN VARIOUS ORBITER LOCATIONS  
PART NUMBER: SID161023XX

CAUSES:

EFFECTS/RATIONALE:

THE COMM CARRIER ELECTRONICS MODULE (CCEM) IS AN ELECTRONICS DEVICE USED TO AMPLIFY AUDIO SIGNALS FOR THE MICROPHONE (TRANSMIT) CIRCUIT AND TO PASS THROUGH EARPHONE (RECEIVE) SIGNALS FROM/TO A CREW MEMBER USING THE COMM CARRIER. LOSS OF FUNCTION OF A SINGLE CCEM WOULD NOT AFFECT MISSION NOR ENDANGER CREW/VEHICLE. LOSS OF ALL CAPABILITY FOR VOICE COMM WOULD CAUSE MISSION ABORT.

REFERENCES: SCHEMATIC DIAGRAMS SID16102312, SID16102320, SID16102324, SID16102330; JSC-12820 FLIGHT RULES, SECTION 11

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 9021 ABORT: 3/3

ITEM: TELEPRINTER, INTERIM  
FAILURE MODE: ERRATIC OPERATION, INTERMITTENT OPERATION,  
PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL), LOSS OF OUTPUT,  
SHORTED, FAILS TO START/STOP

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CREW EQUIPMENT/COMM
- 3) TELEPRINTER, INTERIM
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE,  
PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE INTERIM TELEPRINTER IS USED FOR UPLINKING OF TEXT DATA. IT  
USES ONE OF THE TWO OPERATIONAL VOICE CHANNELS - UPLINK FOR TEXT  
DATA, DOWNLINK FOR A 400 HERTZ TELEMETRY TONE. A FAILURE IN THE  
AUDIO SIGNAL INPUT LINE, COMM CONTROL MODULE, MEMORY,  
CENTRAL PROCESSOR UNIT, PRINTER CONTROL, OR PRINTER, FOR  
INSTANCE, COULD PREVENT RECEIPT OF TEXT. LOSS OF TELEPRINTER  
FUNCTION WOULD NOT CAUSE LOSS OF MISSION OR ENDANGER  
CREW/VEHICLE.

REFERENCES: SSSH 16.6

REPORT DATE 12/31/87

C-916

C-11-

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 9031 ABORT: 3/3

ITEM: MICROPHONE, HAND HELD  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CREW EQUIPMENT/COMM
- 3) MICROPHONE, HAND- HELD
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: USED IN VARIOUS LOCATIONS, FLT DECK, MIDDECK  
PART NUMBER: SID16101316

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE,  
PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE HAND HELD MICROPHONE IS USED BY THE CREW ALONG WITH THE  
SPEAKER-MICROPHONE FOR VARIOUS TWO-WAY VOICE COMM OPERATIONS, AND  
THAT PROCEDURE OBVIATES THE NEED TO HAVE A HEADSET ON. LOSS OF  
FUNCTION WOULD NOT CAUSE LOSS OF MISSION OR ENDANGER  
CREW/VEHICLE.

REFERENCES: SCHEMATIC SID16101316

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: /  
MDAC ID: 9041 ABORT: 3/1R

ITEM: RADIO, PRC 90-2  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CREW EQUIPMENT/COMM
- 3) RADIO, HAND-HELD TRANSCEIVER PRC 90-2
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	/	ATO:	3/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: SURVIVAL KIT  
PART NUMBER: ACR ELECTRONICS, INC. 18560

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION, CHEMICAL REACTION

EFFECTS/RATIONALE:

THE PRC 90-2 TRANSCEIVER IS USED AS A SURVIVAL RADIO. IT CAN OPERATE IN BEACON OR BEACON/VOICE MODE. LOSS OF THE ITEM WOULD NOT BY ITSELF CAUSE LOSS OF CREW MEMBER. LOSS OF REDUNDANT MEANS OF LOCATION (E.G., AN/URT-33 RADIO BEACON, DAY/NIGHT SMOKE FLARE, PEN-GUN FLARE KIT, DYE MARKER, SIGNAL MIRROR) COULD RESULT IN LOSS OF CREW MEMBER.

REFERENCES: NONE AVAILABLE

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: /  
MDAC ID: 9042 ABORT: 3/1R

ITEM: RADIO, RF BEACON, AN/URT-33  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CREW EQUIPMENT/COMM
- 3) RADIO, RF BEACON, AN/URT-33
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	/	ATO:	3/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: SURVIVAL KIT - PARACHUTE  
PART NUMBER: AN/URT-33

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE,  
PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE AN/URT-33 RF BEACON IS ACTUATED AT PARACHUTE OPENING. IT OPERATES ONLY IN RF BEACON MODE (NO VOICE CAPABILITY). LOSS OF THE ITEM WOULD NOT BY ITSELF CAUSE LOSS OF CREWMEMBER. LOSS OF REDUNDANT MEANS OF LOCATION (E.G., PRC 90-2 HAND-HELD TRANSCEIVER, DAY/NIGHT SMOKE FLARE, PEN-GUN FLARE KIT, DYE MARKER, SIGNAL MIRROR) COULD RESULT IN LOSS OF CREW MEMBER.

REFERENCES: NONE AVAILABLE

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 9051 ABORT: 3/3

ITEM: HEADSET INTERFACE UNIT  
FAILURE MODE: OPEN (ELECTRICAL), LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CREW EQUIPMENT/COMM
- 3) HEADSET INTERFACE UNIT (HIU)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: VARIOUS AUDIO TERMINATION UNIT LOCATIONS  
PART NUMBER: MC409-0005-0XXX

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE,  
PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE HIU PROVIDES EARPHONE VOLUME CONTROL AND PUSH-TO-TALK  
TRANSMIT CAPABILITY FOR HEADSETS. LOSS OF FUNCTION FOR EITHER  
TRANSMIT OR RECEIVE WOULD PREVENT TWO-WAY COMM VIA HEADSET FOR  
THE AFFECTED CREWMAN.

REFERENCES: SCHEMATIC DIAGRAM MC409-0005-0144, FLIGHT RULES JSC-  
12820 SECTION 11



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 9052 ABORT: 3/3

ITEM: HEADSET INTERFACE UNIT  
FAILURE MODE: SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CREW EQUIPMENT/COMM
- 3) HEADSET INTERFACE UNIT (HIU)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: USED AT VARIOUS AUDIO TERMINATION UNIT LOCATIONS  
PART NUMBER: MC409-0005-0

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE HIU PROVIDES EARPHONE VOLUME CONTROL AND PUSH-TO-TALK TRANSMIT CAPABILITY FOR HEADSETS. LOSS OF FUNCTION FOR EITHER TRANSMIT OR RECEIVE WOULD PREVENT TWO-WAY COMM VIA HEADSET FOR THE AFFECTED CREWMAN.

REFERENCES: SCHEMATIC DIAGRAM SED16101900-301; FLIGHT RULES JSC-12720, SECTION 11

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 9053 ABORT: 3/3

ITEM: MULTIPLE HEADSET ADAPTER  
FAILURE MODE: OPEN (ELECTRICAL), LOSS OF OUTPUT, SHORTED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CREW EQUIPMENT/COMM
- 3) MULTIPLE HEADSET ADAPTER
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: USED AT VARIOUS AUDIO TERMINATION UNIT LOCATIONS  
PART NUMBER: MC409-0005-0XXX

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE MULTIPLE HEADSET ADAPTER (MHA) PERMITS UP TO THREE CREWMEN TO BE CONNECTED TO A SINGLE AUDIO TERMINATION UNIT (ATU). LOSS OF MHA FUNCTION WOULD NOT AFFECT MISSION OR CREW/VEHICLE.

REFERENCES: SCHEMATIC DIAGRAM MC409-0005-0300, FLIGHT RULES JSC-12820 SECTION 11

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 9054 ABORT: 3/3

ITEM: HEADSET CABLE  
FAILURE MODE: OPEN (ELECTRICAL), LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CREW EQUIPMENT/COMM
- 3) HEADSET CABLE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: USED AT VARIOUS AUDIO TERMINATION UNIT LOCATIONS  
PART NUMBER: MC409-0005-0240

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE,  
PIECE-PART FAILURE

EFFECTS/RATIONALE:

THE HEADSET CABLE IS A FOUR-FOOT CABLE USED TO CONNECT THE HEADSET INTERFACE UNIT TO COMM BULKHEAD RECEPTACLES DIRECTLY OR THROUGH A MULTIPLE HEADSET ADAPTER. ADDITIONAL SECTIONS CAN BE USED TO EXTEND THE OVERALL LENGTH OF THE CABLE. LOSS OF FUNCTION OF THE CABLE WOULD NOT AFFECT MISSION OR CREW/VEHICLE.

REFERENCES: SCHEMATIC DIAGRAM MC409-0005-0240, FLIGHT RULES JSC-12820 SECTION 11

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 9061 ABORT: 3/3

ITEM: VIDEO TAPE RECORDER  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIDEO TAPE RECORDER (VTR)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL L12 OR R11  
PART NUMBER:

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE VTR PROVIDES THE CAP TO RECORD AND PLAYBACK VIDEO FROM ANY OF THE CCTV CAMERAS. LOSS OF THIS CAPABILITY MAY CAUSE LOSS OF EXPERIMENT DATA BUT WOULD NOT PROVIDE BASIS FOR LOSS OF MISSION. (NO LIKE OR UNLIKE REDUNDANCY EXISTS FOR THIS UNIT.)

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-924

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 9062 ABORT: 3/3

ITEM: VIDEO TAPE RECORDER  
FAILURE MODE: FAILS TO START/STOP

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIDEO TAPE RECORDER (VTR)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL L12 OR R11  
PART NUMBER:

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL  
SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT  
ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND  
STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR,  
RMS, AND ATTACHED P/L. THE VTR PROVIDES THE CAP TO RECORD AND  
PLAYBACK VIDEO FROM ANY OF THE CCTV CAMERAS. LOSS OF THIS  
CAPABILITY MAY CAUSE LOSS OF EXPERIMENT DATA BUT WOULD NOT  
PROVIDE BASIS FOR LOSS OF MISSION. (NO LIKE OR UNLIKE REDUNDANCY  
EXISTS FOR THIS UNIT.)

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH  
16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-925

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 9063 ABORT: 3/3

ITEM: VIDEO TAPE RECORDER  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIDEO TAPE RECORDER (VTR)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL L12 OR R11  
PART NUMBER:

CAUSES: CONTAMINATION, TEMPERATURE, LOSS OF INPUT, MECHANICAL SHOCK, VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE VTR PROVIDES THE CAP TO RECORD AND PLAYBACK VIDEO FROM ANY OF THE CCTV CAMERAS. BINDING/JAMMING WOULD CAUSE LOSS OF VTR CAPABILITY WHICH MAY CAUSE LOSS OF EXPERIMENT DATA BUT WOULD NOT PROVIDE BASIS FOR LOSS OF MISSION. (NO LIKE OR UNLIKE REDUNDANCY EXISTS FOR THIS UNIT.)

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-926

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 9064 ABORT: 3/3

ITEM: VIDEO TAPE RECORDER PWR SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIDEO TAPE RECORDER (VTR)
- 4) PWR SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL L12 OR R11  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE VCR PROVIDES THE CAP TO RECORD AND PLAYBACK VIDEO FROM ANY OF THE CCTV CAMERAS. LOSS OF THIS CAPABILITY MAY CAUSE LOSS OF EXPERIMENT DATA BUT WOULD NOT PROVIDE BASIS FOR LOSS OF MISSION. (NO LIKE OR UNLIKE REDUNDANCY EXISTS FOR THIS UNIT.) PWR SW CONTROLS POWER TO VCR. FAILURE TO CLOSE WOULD CAUSE LOSS OF VTR CAP. NO CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-927

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 9065 ABORT: 3/3

ITEM: VIDEO TAPE RECORDER PWR SW  
FAILURE MODE: OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIDEO TAPE RECORDER (VTR)
- 4) PWR SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL L12 OR R11  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. VCR PROVIDES CAP TO RECORD AND PLAYBACK VIDEO FROM ANY OF THE CCTV CAMERAS. LOSS OF THIS CAPABILITY MAY CAUSE LOSS OF EXPERIMENT DATA BUT WOULD NOT PROVIDE BASIS FOR LOSS OF MISSION. (NO LIKE OR UNLIKE REDUNDANCY EXISTS FOR THIS UNIT.) PWR SW CONTROLS POWER TO VCR. OPEN/SHORT WOULD PREVENT INERGIZING VTR. NO CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-928



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 9066 ABORT: 3/3

ITEM: VIDEO TAPE RECORDER AUDIO MODE SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIDEO TAPE RECORDER (VTR)
- 4) AUDIO MODE SW
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL L12  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. VCR PROVIDES CAP TO RECORD AND PLAYBACK VIDEO FROM ANY OF THE CCTV CAMERAS. LOSS OF THIS CAPABILITY MAY CAUSE LOSS OF EXPERIMENT DATA BUT WOULD NOT PROVIDE BASIS FOR LOSS OF MISSION. (NO LIKE OR UNLIKE REDUNDANCY EXISTS FOR THIS UNIT.) AUDEO MODE SW SELECTS PTT OR HOTMIKE FOR THE HEADSET INTERFACE UNIT (HIU) RECORDING MODE. FAILURE TO SW WOULD PREVENT AUDIO MODE SELECTION. NO CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-929

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 9067 ABORT: 3/3

ITEM: VIDEO TAPE RECORDER AUDIO MODE SW  
FAILURE MODE: OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIDEO TAPE RECORDER (VTR)
- 4) AUDIO MODE SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL L12  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. VCR PROVIDES CAP TO RECORD PLAYBACK VIDEO FROM ANY OF THE CCTV CAMERAS. LOSS OF THIS CAPABILITY MAY CAUSE LOSS OF EXPERIMENT DATA BUT WOULD NOT PROVIDE BASIS FOR LOSS OF MISSION. (NO LIKE OR UNLIKE REDUNDANCY EXISTS FOR THIS UNIT.) AUDEO MODE SW SELECTS PTT OR HOTMIKE FOR THE HEADSET INTERFACE UNIT (HIU) RECORDING MODE. OPEN/SHORT WOULD PREVENT AUDIO MODE SELECTION. NO CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-930

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 9068 ABORT: 3/3

ITEM: VIDEO TAPE RECORDER VIDEO MODE SW  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIDEO TAPE RECORDER (VTR)
- 4) VIDEO MODE SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: VTR  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. VCR PROVIDES CAP TO RECORD AND PLAYBACK VIDEO FROM ANY OF THE CCTV CAMERAS. LOSS OF THIS CAPABILITY MAY CAUSE LOSS OF EXPERIMENT DATA BUT WOULD NOT PROVIDE BASIS FOR LOSS OF MISSION. (NO LIKE OR UNLIKE REDUNDANCY EXISTS FOR THIS UNIT.) VIDEO MODE SW SELECTS NTSC COLOR OR B/W / FSC (BLACK AND WHITE /FIELD SEQUENTIAL COLOR) SIGNALS. FAILURE TO SW WOULD PREVENT VIDEO MODE SELECTION. NO CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-931

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 9069 ABORT: 3/3

ITEM: VIDEO TAPE RECORDER VIDEO MODE SW  
FAILURE MODE: OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIDEO TAPE RECORDER (VTR)
- 4) VIDEO MODE SW
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: VTR  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. VCR PROVIDES CAP TO RECORD AND PLAYBACK VIDEO FROM ANY OF THE CCTV CAMERAS. LOSS OF THIS CAPABILITY MAY CAUSE LOSS OF EXPERIMENT DATA BUT WOULD NOT PROVIDE BASIS FOR LOSS OF MISSION. (NO LIKE OR UNLIKE REDUNDANCY EXISTS FOR THIS UNIT.) VIDEO MODE SW SELECTS NTSC COLOR OR B/W / FSC (BLACK AND WHITE / FIELD SEQUENTIAL COLOR) SIGNALS. OPEN/SHORT WOULD PREVENT VIDEO MODE SELECTION. NO CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-932

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 9070 ABORT: 3/3

ITEM: VIDEO TAPE RECORDER FUNCTION SELECT PUSH BUTTONS  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIDEO TAPE RECORDER (VTR)
- 4) FUNCTION SELECT PB
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: VTR  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. VCR PROVIDES CAP TO RECORD AND PLAYBACK VIDEO FROM ANY OF THE CCTV CAMERAS. LOSS OF THIS CAPABILITY MAY CAUSE LOSS OF EXPERIMENT DATA BUT WOULD NOT PROVIDE BASIS FOR LOSS OF MISSION. (NO LIKE OR UNLIKE REDUNDANCY EXISTS FOR THIS UNIT.) VTR FUNC SW CONTROL VTR OPERATION i.e. EJECT, FF, RCD, PLAY, STOP, REWIND, ETC. ONLY RCD, PLAY, AND STOP POSITIONS COULD CAUSE LOSS OF VTR CAP. FAILURE TO SW COULD CAUSE LOSS OF VTR. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-933

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 9071 ABORT: 3/3

ITEM: VIDEO TAPE RECORDER FUNCTION SELECT PUSH BUTTONS  
FAILURE MODE: OPEN/SHORT

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIDEO TAPE RECORDER (VTR)
- 4) FUNCTION SELECT PB
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: VTR  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. VCR PROVIDES CAP TO RECORD AND PLAYBACK VIDEO FROM ANY OF THE CCTV CAMERAS. LOSS OF THIS CAPABILITY MAY CAUSE LOSS OF EXPERIMENT DATA BUT WOULD NOT PROVIDE BASIS FOR LOSS OF MISSION. (NO LIKE OR UNLIKE REDUNDANCY EXISTS FOR THIS UNIT.) VTR FUNC SW CONTROL VTR OPERATION i.e. EJECT, FF, RCD, PLAY, STOP, REWIND, ETC. ONLY RCD, PLAY, AND STOP POSITIONS COULD CAUSE LOSS OF VTR CAP. OPEN/SHORT COULD CAUSE LOSS OF VTR CAP. NOT CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-934

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/87  
SUBSYSTEM: COMM AND TRACK  
MDAC ID: 9091

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 3/3

ITEM: WIRELESS CREW COMM SYSTEM (WCCS)  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS

SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CREW EQUIPMENT
- 3) WIRELESS CREW COMM SYSTEM
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: USED IN VARIOUS ORBITER LOCATIONS  
PART NUMBER: SEC1602306-311/321 (NASA/DOD); SED1602305-311 THRU 315/321 THRU 325 (NASA/DOD)

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE,  
PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE WCCS IS A TWO-WAY RADIO VOICE LINK THAT PERMITS CREWMEMBERS TO MOVE ABOUT IN THE ORBITER UNHAMPERED BY CABLE CONNECTIONS TO BULKHEAD AUDIO JACKS. THE DOD VERSIONS PROVIDE CAPABILITY FOR VOICE ENCRYPTION/DECRYPTION. THE SED1602306 DEVICES ARE CARRIED BY CREWMEMBERS; THE SED1602305 DEVICES ARE THE BULKHEAD-MOUNTED UNITS THAT INTERFACE VIA RF WITH CREW AND VIA CABLE/CONNECTOR WITH BULKHEAD AUDIO JACKS. LOSS OF TWO-WAY COMM VIA ONE WCCS SET WOULD NOT AFFECT MISSION OR ENDANGER CREW/VEHICLE.

LOSS OF ALL AUDIO CAPABILITY FOR VOICE COMM VIA WCCS AND VIA HARDLINE WOULD CAUSE MISSION ABORT.

REFERENCES:

REPORT DATE 12/31/87

C-935

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 9521 ABORT: 3/3

ITEM: CIRCUIT BREAKER  
FAILURE MODE: OPEN (ELECTRICAL)

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CREW EQUIPMENT/COMM
- 3) TELEPRINTER, INTERIM
- 4) PANEL 016/014
- 5) CIRCUIT BREAKER CB9/CB10
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:

PART NUMBER:

CAUSES: CONTAMINATION, OVERLOAD, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

CB9 SUPPLIES UTILITY POWER TO PANEL A11 (AFT FLIGHT DECK), CB10 TO M052J (MID-DECK). TELEPRINTER POWER CORD CAN BE PLUGGED IN AT EITHER PANEL. THE TELEPRINTER IS USED TO UPLINK TEXT DATA. LOSS OF TELEPRINTER FUNCTION BECAUSE OF FAILED CIRCUIT BREAKERS WOULD NOT AFFECT MISSION OR CREW/VEHICLE.

REFERENCES: SSSH 16.6



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: /  
MDAC ID: 9541 ABORT: 3/1R

ITEM: BATTERY  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CREW EQUIPMENT/COMM
- 3) RADIO, HAND-HELD TRANSCEIVER PRC 90-2
- 4) BATTERY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	/	ATO:	3/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 1 ] B [ NA ] C [ P ]

LOCATION: SURVIVAL KIT  
PART NUMBER: BA1586/U

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE,  
VIBRATION, CHEMICAL REACTION

EFFECTS/RATIONALE:

THIS MERCURY-OXIDE TYPE BATTERY PROVIDES POWER FOR THE PRC 90-2 HAND-HELD TRANSCEIVER. LOSS OF BATTERY POWER AND CONSEQUENT LOSS OF TRANSCEIVER FUNCTION WOULD NOT BY ITSELF CAUSE LOSS OF CREWMEMBER. LOSS OF ALL REDUNDANT MEANS OF LOCTION (REFERENCE IOA 9041) COULD RESULT IN LOSS OF CREWMEMBER. NOTE: BECAUSE OF THE MERCURY CONTENT IN THE BATTERIES, A TOXIC SUBSTANCE WAIVER MUST BE APPROVED TO CARRY THE BATTERIES ON THE ORBITER.

REFERENCES: NONE AVAILABLE.

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: / ,  
MDAC ID: 9542 ABORT: 3/1R

ITEM: BATTERY  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CREW EQUIPMENT/COMM
- 3) RADIO, RF BEACON AN/URT-33
- 4) BATTERY
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	/	ATO:	3/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: SURVIVAL KIT - PARACHUTE  
PART NUMBER: POWER PACK ACR-311A

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE,  
VIBRATION, CHEMICAL REACTION

EFFECTS/RATIONALE:

A POWER PACK USING ALKALINE MAGNESIUM DIOXIDE BATTERIES PROVIDES POWER FOR THE AN/URT-33 RF BEACON TRANSMITTER. LOSS OF POWER AND CONSEQUENT LOSS OF RF BEACON WOULD NOT BY ITSELF CAUSE LOSS OF CREWMEMBER. LOSS OF ALL REDUNDANT MEANS OF LOCATION (REFERENCE IOA 9042) COULD RESULT IN LOSS OF CREW MEMBER. NOTE: ACR IS DESIGNATOR FOR ACR ELECTRONICS, INC. OF FORT LAUDERDALE, FLORIDA.

REFERENCES: NONE AVAILABLE

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 9561 ABORT: 3/3

ITEM: VTR CB 3 (5A)  
FAILURE MODE: FAIL OPEN

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIDEO TAPE RECORDER (VTR)
- 4) CABPL 2
- 5) CIRCUIT BREAKER (CB 3)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL L12  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE VCR PROVIDES THE CAP TO RECORD AND PLAYBACK VIDEO FROM ANY OF THE CCTV CAMERAS. LOSS OF THIS CAPABILITY MAY CAUSE LOSS OF EXPERIMENT DATA BUT WOULD NOT PROVIDE BASIS FOR LOSS OF MISSION. (NO LIKE OR UNLIKE REDUNDANCY EXISTS FOR THIS UNIT.) CB 3 CONTROLS POWER TO VCR CB1. FAILURE TO CLOSE WOULD CAUSE LOSS OF VTR CAP. NO CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-939

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 9562 ABORT: 3/3

ITEM: VTR CB 3 (5A)  
FAILURE MODE: FAIL CLOSED

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIDEO TAPE RECORDER (VTR)
- 4) CABPL 2
- 5) CIRCUIT BREAKER (CB 3)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL L12  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE VCR PROVIDES THE CAP TO RECORD AND PLAYBACK VIDEO FROM ANY OF THE CCTV CAMERAS. LOSS OF THIS CAPABILITY MAY CAUSE LOSS OF EXPERIMENT DATA BUT WOULD NOT PROVIDE BASIS FOR LOSS OF MISSION. (NO LIKE OR UNLIKE REDUNDANCY EXISTS FOR THIS UNIT.) CB 3 CONTROLS POWER TO VCR CB1. CLOSED CB WOULD HAVE NO AFFECT ON VTR OPERATION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-940

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 9563 ABORT: 3/3

ITEM: VTR CB 1 (3A)  
FAILURE MODE: FAIL OPEN

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIDEO TAPE RECORDER (VTR)
- 4) CABPL 2
- 5) CIRCUIT BREAKER (CB 1)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL L12  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE VCR PROVIDES THE CAP TO RECORD AND PLAYBACK VIDEO FROM ANY OF THE CCTV CAMERAS. LOSS OF THIS CAPABILITY MAY CAUSE LOSS OF EXPERIMENT DATA BUT WOULD NOT PROVIDE BASIS FOR LOSS OF MISSION. (NO LIKE OR UNLIKE REDUNDANCY EXISTS FOR THIS UNIT.) CB 1 CONTROLS POWER TO VCR. FAILURE TO CLOSE WOULD CAUSE LOSS OF VTR CAP. NO CAUSE FOR LOSS OF MISSION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-941

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 9564 ABORT: 3/3

ITEM: VTR CB 1 (3A)  
FAILURE MODE: FAIL CLOSED

LEAD ANALYST: W.C. LONG SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CCTV
- 3) VIDEO TAPE RECORDER (VTR)
- 4) CABPL 2
- 5) CIRCUIT BREAKER (CB 1)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL L12  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART FAILURE

EFFECTS/RATIONALE:

CCTV SYS PROVIDES ESSENTIAL VISUAL FEEDBACK TO DOCUMENT ONORBIT ACTIVITIES, SUPPORT MISSION EXP OPS, ASSIST IN RENDEZ AND STA/KEEP OPS, INSPECT/MONITOR P/L BAY DOOR LATCHES, ORB EXTERIOR, RMS, AND ATTACHED P/L. THE VCR PROVIDES THE CAP TO RECORD AND PLAYBACK VIDEO FROM ANY OF THE CCTV CAMERAS. LOSS OF THIS CAPABILITY MAY CAUSE LOSS OF EXPERIMENT DATA BUT WOULD NOT PROVIDE BASIS FOR LOSS OF MISSION. (NO LIKE OR UNLIKE REDUNDANCY EXISTS FOR THIS UNIT.) CB 1 IN SERIES WITH CB 3 CONTROLS POWER TO VCR. CLOSED CB WOULD HAVE NO AFFECT ON VTR OPERATION.

REFERENCES: FLT RULES, SHUTTLE FLT OPS MANUAL JSC-12770, SSSH 16.1,.12,.13,.24, SYS SCHEMATIC VS70-740189, OMRSD NSTS 08171

REPORT DATE 12/31/87

C-942

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 9591 ABORT: 3/3

ITEM: BATTERY  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) CREW EQUIPMENT/COMM
- 3) WIRELESS CREW COMM SYSTEM (WCCS)
- 4) BATTERY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [NA ] C [ P ]

LOCATION: USED IN VARIOUS ORBITER LOCATIONS  
PART NUMBER: SED16102307

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, VIBRATION, CHEMICAL REACTION

EFFECTS/RATIONALE:

THIS ZINC/AIR BATTERY POWERS THE WCCS UNITS (REFER TO RELATED IOA 9091). LOSS OF BATTERY POWER AND CONSEQUENT LOSS OF WCCS FUNCTION FOR ONE SET WOULD NOT BY ITSELF CAUSE MISSION LOSS. LOSS OF ALL CAPABILITY FOR TWO-WAY VOICE COMM VIA WCCS UNITS AND VIA HARDLINE WOULD CAUSE LOSS OF MISSION.

REFERENCES: SED16102307; FLIGHT RULES JSC-12820, SECTION 11

REPORT DATE 12/31/87

C-943

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 10001 ABORT: 3/3

ITEM: EMU/TV-POWER SWITCH  
FAILURE MODE: FAIL OPEN

LEAD ANALYST: W.H. TRAHAN SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) EMU
- 3) TV
- 4) POWER SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: EMU HELMET  
PART NUMBER: 10160-20070-1

CAUSES: SHOCK, VIBRATION, CONTAMINATION

EFFECTS/RATIONALE:

NONE. POWER NOT SUPPLIED TO SYSTEM USED TO PROVIDE TV COVERAGE OF THE EVA CREWMAN'S ACTIVITIES. NOT CRITICAL TO CREW/VEHICLE SAFETY OR MISSION COMPLETION.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 10002 ABORT: 3/3

ITEM: EMU/TV-LIGHT EMITTING DIODE  
FAILURE MODE: FAIL OPEN

LEAD ANALYST: W.H. TRAHAN SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) EMU
- 3) TV
- 4) LED
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: EMU HELMET  
PART NUMBER: 10160-20070-01

CAUSES: SHOCK, VIBRATION, CONTAMINATION

EFFECTS/RATIONALE:

NONE. LED INDICATES POWER SUPPLIED TO SYSTEM. DIODE FAILED OPEN  
DOES NOT RESTRICT POWER TO THE REMAINDER OF THE SYSTEM. TV  
SYSTEM CAN CONTINUE TO FUNCTION IN THE NORMAL WAY.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 10003 ABORT: 3/3

ITEM: EMU/TV-CLOSE-UP LENS SWITCH  
FAILURE MODE: FAILED TO TRANSFER

LEAD ANALYST: W.H. TRAHAN SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) EMU
- 3) TV
- 4) CLOSE-UP LENS SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: EMU HELMET  
PART NUMBER: 10160-20070-

CAUSES: SHOCK, VIBRATION, CONTAMINATION

EFFECTS/RATIONALE:

NONE. OBJECTS IN THE RANGE OF THE MODE THE SWITCH IS IN WILL BE VIEWED. NOT CRITICAL TO CREW/VEHICLE SAFETY OR MISSION COMPLETION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 10004 ABORT: 3/3

ITEM: EMU/TV-TV CAMERA  
FAILURE MODE: NO OUTPUT

LEAD ANALYST: W.H. TRAHAN SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) EMU
- 3) TV-CAMERA
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: EMU HELMET  
PART NUMBER: SED 181000277-303

CAUSES: SHOCK, VIBRATION, CONTAMINATION, PIECE-PART STRUCTURAL

EFFECTS/RATIONALE:

NONE. NO VIDEO SIGNALS RECEIVED TO BE TRANSMITTED. NO TV  
COVERAGE OF EVA CREWMAN'S ACTIVITIES. NOT CRITICAL TO  
CREW/VEHICLE SAFETY BY MISSION COMPLETION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 10005 ABORT: 3/3

ITEM: EMU/TV-TRANSMITTER  
FAILURE MODE: NO OUTPUT

LEAD ANALYST: W.H. TRAHAN SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) EMU
- 3) TV
- 4) TRANSMITTER
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: EMU HELMET  
PART NUMBER: 102101-1

CAUSES: SHOCK, VIBRATION, CONTAMINATION, PIECE-PART STRUCTURAL  
FAILURE

EFFECTS/RATIONALE: NONE. VIDEO SIGNAL NOT TRANSMITTED, NO TV COVERAGE OF EVA  
CREWMAN'S ACTIVITIES. NOT CRITICAL TO CREW/VEHICLE SAFETY OR  
MISSION COMPLETION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/87  
SUBSYSTEM: COMM AND TRACK  
MDAC ID: 10006

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: EMU/TV-ANTENNA  
FAILURE MODE: NO OUTPUT

LEAD ANALYST: W.H. TRAHAN

SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) EMU
- 3) TV
- 4) ANTENNA
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: EMU HELMET  
PART NUMBER: SED 18100042-305

CAUSES: SHOCK, VIBRATION, CONTAMINATION, PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NONE. VIDEO SIGNAL NOT TRANSMITTED, NO TV COVERAGE OF EVA CREWMAN'S ACTIVITIES. NOT CRITICAL TO CREW/VEHICLE SAFETY OR MISSION COMPLETION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 10007 ABORT: 3/3

ITEM: EMU/TV-REC/VPU  
FAILURE MODE: NO OUTPUT

LEAD ANALYST: W.H. TRAHAN SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) EMU
- 3) TV
- 4) REC/VPU
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK  
PART NUMBER: SED 18100025-302

CAUSES: SHOCK, VIBRATION, CONTAMINATION, PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NONE. VIDEO SIGNALS RECEIVED ARE NOT CONVERTED TO IMAGES. NO TV COVERAGE OF EVA CREWMAN'S ACTIVITIES. NOT CRITICAL TO CREW/VEHICLE SAFETY OR MISSION COMPLETION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 10501 ABORT: 3/3

ITEM: EMU/TV-BATTERY PACK  
FAILURE MODE: NO OUTPUT

LEAD ANALYST: W.H. TRAHAN SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) EMU
- 3) TV
- 4) BATTERY PACK
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK  
PART NUMBER: 10160-2000-01

CAUSES: SHOCK, VIBRATION, CONTAMINATION

EFFECTS/RATIONALE:

NONE. NO POWER SUPPLIED TO THE SYSTEM USED TO PROVIDE TV  
COVERAGE OF THE EVA CREWMAN'S ACTIVITIES. NOT CRITICAL TO  
CREW/VEHICLE SAFETY OR MISSION COMPLETION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 1/1  
MDAC ID: 10502 ABORT: 1/1

ITEM: EMU/TV-BATTERY PACK  
FAILURE MODE: VENTING/EXPLOSION

LEAD ANALYST: W.H. TRAHAN SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM & TRACK
- 2) EMU
- 3) TV
- 4) BATTERY PACK
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	1/1	RTLS:	1/1
LIFTOFF:	1/1	TAL:	1/1
ONORBIT:	1/1	AOA:	1/1
DEORBIT:	1/1	ATO:	1/1
LANDING/SAFING:	1/1		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID DECK  
PART NUMBER: 10160-2001-01

CAUSES: SHOCK, VIBRATION, CONTAMINATION

EFFECTS/RATIONALE:

VENTING THAT RESULTS IN EXPLOSION COULD RESULT IN LOSS OF CREWMAN OR DAMAGE TO THE VEHICLE. DESIGN, TESTING AND FAILURE HISTORY RESULTS IN LOW PROBABILITY OF THIS FAILURE OCCURING.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 11001 ABORT: 3/1R

ITEM: GCIL DRIVER, S-BAND PM TRANSPONDER  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM AND TRACK
- 2) S-BAND PM/NSP SYSTEM
- 3) S-BAND PM TRANSPONDER
- 4) GCIL DRIVER
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/2R	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC450-0051-0002

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE,  
VIBRATION

EFFECTS/RATIONALE:

THE GROUND COMMAND INTERFACE LOGIC (GCIL) DRIVERS PROVIDE CAPABILITY TO CONTROL SELECTED COMM & TRACK LRU'S EITHER IN "COMMAND" MODE (GROUND COMMANDS OR KEYBOARD INPUTS) OR IN "PANEL" MODE (CREW CONTROL VIA PANEL SWITCHES). LOSS OF GCIL DRIVER OUTPUT (E.G., "XPNDER 1/2 ON") WOULD DISABLE THE AFFECTED LRU BECAUSE THE ASSOCIATED TYPE III DRIVER WOULD NOT BE TURNED ON, AND TWO-WAY COMM VIA THAT XPNDR WOULD BE LOST. THE REDUNDANT XPNDR WOULD BE SELECTED. LOSS OF ALL CAPABILITY FOR STATE VECTOR UPDATE VIA S-BAND PM, UHF VOICE, (AND KU-BAND ON-ORBIT) COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SYSTEM SCHEMATICS VS70-740129; VS70-740299; SSSH 16.1, 16.2; INCO/COMM SYSTEMS BRIEFS 3, 5; OMRSD V74 FILE III; JSC-12820 FLT RULES SECT 11

REPORT DATE 12/31/87

C-953

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 11002 ABORT: 3/1R

ITEM: GCIL DRIVER, S-BAND PM TRANSPONDER  
FAILURE MODE: INADVERTENT OPERATION, PREMATURE OPERATION

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM AND TRACK
- 2) S-BAND PM/NSP SYSTEM
- 3) S-BAND PM TRANSPONDER
- 4) GCIL DRIVER
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/2R	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC450-0051-0002

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE,  
VIBRATION

EFFECTS/RATIONALE:

THE GROUND COMMAND INTERFACE LOGIC (GCIL) DRIVERS PROVIDE CAPABILITY TO CONTROL SELECTED COMM & TRACK LRU'S EITHER IN "COMMAND" MODE (GROUND COMMANDS OR KEYBOARD INPUTS) OR IN "PANEL" MODE (CREW CONTROL VIA PANEL SWITCHES). PREMATURE/INADVERTENT OPERATION OF A MODE/CONFIGURATION CONTROL GCIL DRIVER (E.G., XPNDR FREQUENCY LOW WHEN FREQUENCY HIGH IS DESIRED, OR XPNDR 1 ON WHEN LRU 2 IS ON) COULD CAUSE SYSTEM MISCONFIGURATION OR CYCLING BETWEEN TWO MODES THAT WOULD CAUSE LOSS OF S-BAND PM COMM. LOSS OF ALL CAPABILITY FOR STATE VECTOR UPDATE VIA S-BAND PM, UHF VOICE, (AND KU-BAND ON-ORBIT) COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SYSTEM SCHEMATICS VS70-740129; VS70-740299; SSSH 16.1, 16.2; INCO/COMM SYSTEMS BRIEFS 3, 5; OMRSD V74 FILE III; JSC-12820 FLT RULES SECT 11

REPORT DATE 12/31/87 C-954

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 11003 ABORT: 3/3

ITEM: GCIL DRIVER, S-BAND PM AMPLIFIER SYSTEM  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM AND TRACK
- 2) S-BAND PM AMPLIFIER SYSTEM
- 3) S-BAND PM POWER AMP/PREAMP
- 4) GCIL DRIVER
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC450-0051-0002

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE,  
VIBRATION

EFFECTS/RATIONALE:

THE GROUND COMMAND INTERFACE LOGIC (GCIL) DRIVERS PROVIDE CAPABILITY TO CONTROL SELECTED COMM & TRACK LRU'S EITHER IN "COMMAND" MODE (GROUND COMMANDS OR KEYBOARD INPUTS) OR IN "PANEL" MODE (CREW CONTROL VIA PANEL SW). LOSS OF GCIL DRIVER OUTPUT FOR "PA 1/2 OPERATE" WOULD DISABLE THE AFFECTED LRU BECAUSE THE ASSOCIATED TYPE II DRIVER WOULD NOT BE TURNED ON, & HI-POWER MODE FOR PA 1/2 WOULD BE LOST. THE REDUNDANT PA WOULD BE SELECTED. COMPLETE LOSS OF HI-POWER MODE FOR S-BAND PM SYS OPERATION AND KU-BAND COMM COULD CAUSE LOSS OF PRIME MISSION OBJECTIVES BECAUSE OF CONFLICTING VEHICLE ALTITUDE CONSTRAINTS (EXPERIMENT VS COMM ATTITUDE REQTS). OTHER GCIL DRIVERS CONTROL SYS FUNCTIONS WHICH IF LOST COULD CAUSE MISSION LOSS (E.G. PREAMP 1/2 POWER).

REFERENCES: SYSTEM SCHEMATICS VS70-740129; VS70-740299; SSSH 16.1, 16.2; INCO/COMM SYSTEMS BRIEFS 3, 5; OMRSD V74 FILE III; JSC-12820 FLT RULES SECT 11; VS70-740299

REPORT DATE 12/31/87 C-955

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 11004 ABORT: 3/3

ITEM: GCIL DRIVER, S-BAND PM AMPLIFIER SYSTEM  
FAILURE MODE: PREMATURE OPERATION

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM AND TRACK
- 2) S-BAND PM AMPLIFIER SYSTEM
- 3) S-BAND PM POWER AMP/PREAMP
- 4) GCIL DRIVER
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC450-0051-0002

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE,  
VIBRATION

EFFECTS/RATIONALE:

THE GROUND COMMAND INTERFACE LOGIC (GCIL) DRIVERS PROVIDE CAPABILITY TO CONTROL SELECTED COMM & TRACK LRU'S EITHER IN "COMMAND" MODE (GROUND COMMANDS OR KEYBOARD INPUTS) OR IN "PANEL" MODE (CREW CONTROL VIA PANEL SWITCHES). PREMATURE/INADVERTENT OPERATION OF A MODE/CONFIGURATION CONTROL GCIL DRIVER (E.G., PA 1 ON WHEN PA 2 IS ON, OR XPNDR 1 ON W/ XPNDR 2 ON, OR FREQUENCY HI & FREQUENCY LO OUTPUTS SIMULTANEOUSLY) WOULD CAUSE COAXIAL RF SWITCHES TO CYCLE CONTINUOUSLY & TWO-WAY COMM IN HI-PWR MODE WOULD BE LOST, REQUIRING SELECTION OF LOW POWER MODE. LOSS OF KU-BAND COMM & HI-POWER MODE FOR S-BAND PM COMM COULD CAUSE LOSS OF PRIME MISSION OBJECTIVES BECAUSE OF CONFLICTING VEHICLE ATTITUDE CONSTRAINTS (EXPERIMENT VS COMM ATTITUDE CONSTRAINTS).

REFERENCES: SYSTEM SCHEMATICS VS70-740129; VS70-740299; SSSB 16.2; INCO/COMM SYSTEMS BRIEFS 3, 5; OMRSD V74 FILE III; JSC-12820 FLT RULES SECT 11

REPORT DATE 12/31/87

C-956

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/3  
MDAC ID: 11005 ABORT: 3/3

ITEM: GCIL DRIVER, S-BAND FM SYSTEM  
FAILURE MODE: PREMATURE OPERATION, LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM AND TRACK
- 2) S-BAND FM SYSTEM
- 3) GCIL DRIVER
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC450-0051-0001

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE,  
VIBRATION

EFFECTS/RATIONALE:

THE GROUND COMMAND INTERFACE LOGIC (GCIL) DRIVERS PROVIDE CAPABILITY TO CONTROL SELECTED COMM & TRACK LRU'S EITHER IN "COMMAND" MODE (GROUND COMMANDS OR KEYBOARD INPUTS) OR IN "PANEL" MODE (CREW CONTROL VIA PANEL SWITCHES). LOSS OF CONTROL OF THE FM SYSTEM DOES NOT AFFECT MISSION OR CREW/VEHICLE SAFETY.

REFERENCES: SYSTEM SCHEMATICS VS70-740269, 279, 299; SSSH 16.8;  
JSC-12820 FLT RULES SECT 11

REPORT DATE 12/31/87

C-957

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/09/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/2R  
MDAC ID: 11006 ABORT: 3/3

ITEM: GCIL DRIVER, S-BAND PAYLOAD SYSTEM  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM AND TRACK
- 2) S-BAND PAYLOAD SYSTEM
- 3) GCIL DRIVER
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC450-0021-0001

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE,  
VIBRATION

EFFECTS/RATIONALE:

THE GROUND COMMAND INTERFACE LOGIC (GCIL) DRIVERS PROVIDE CAPABILITY TO CONTROL SELECTED COMM & TRACK LRU'S EITHER IN "COMMAND" MODE (GROUND COMMANDS OR KEYBOARD INPUTS) OR IN "PANEL" MODE (CREW CONTROL VIA PANEL SWITCHES). LOSS OF GCIL DRIVER OUTPUT FOR "PL INTGR 1/2" WOULD DISABLE THE LRU (PAYLOAD INTERROGATOR 1/2). THE REDUNDANT LRU WOULD BE SELECTED. LOSS OF BOTH LRU'S WOULD PREVENT TWO-WAY COMM (COMMANDS/TELEMETRY) WITH DETACHED PAYLOADS AND COULD CAUSE LOSS OF MISSION. MANY OTHER GCIL DRIVERS CONTROL PAYLOAD SYSTEM FUNCTIONS WHICH IF LOST COULD CAUSE MISSION LOSS (E.G., PSP 1/2 ON, PAYLOAD ANTENNA POLARIZATION, PI FREQUENCY SWEEP).

REFERENCES: SYSTEM SCHEMATICS VS70-740239, 299; SSSH 3, 31, 34

REPORT DATE 12/31/87

C-958

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 2/1R  
MDAC ID: 11007 ABORT: 3/1R

ITEM: GCIL DRIVER, NETWORK SIGNAL PROCESSOR  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM AND TRACK
- 2) NETWORK SIGNAL PROCESSOR (NSP)
- 3) GCIL DRIVER
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC450-0021-0002

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE,  
VIBRATION

EFFECTS/RATIONALE:

THE GROUND COMMAND INTERFACE LOGIC (GCIL) DRIVERS PROVIDE CAPABILITY TO CONTROL SELECTED COMM & TRACK LRU'S EITHER IN "COMMAND" MODE (GROUND COMMANDS OR KEYBOARD INPUTS) OR IN "PANEL" MODE (CREW CONTROL VIA PANEL SWITCHES). LOSS OF GCIL DRIVER OUTPUT FOR "NSP 1/2 ON" WOULD CAUSE LOSS OF THE AFFECTED LRU. LOSS OF BOTH NSP'S WOULD CAUSE LOSS OF CAPABILITY TO UPDATE STATE VECTOR VIA S-BAND PM (AND VIA KU-BAND ON-ORBIT). SUBSEQUENT LOSS OF UHF VOICE WOULD CAUSE LOSS OF ALL PATHS FOR SV UPDATE, AND COULD RESULT IN LOSS OF CREW/VEHICLE.

REFERENCES: SYSTEM SCHEMATICS VS70-740229, 299; SSSH 16.3; JSC-12820 FLT RULES SECTION 11; INCO/COMM SYSTEMS BRIEF 3, 27

REPORT DATE 12/31/87

C-959

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 11008 ABORT: 3/3

ITEM: GCIL DRIVER, KU-BAND SYSTEM  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM AND TRACK
- 2) KU-BAND SYSTEM
- 3) GCIL DRIVER
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC450-0021-0002

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE,  
VIBRATION

EFFECTS/RATIONALE:

THE GROUND COMMAND INTERFACE LOGIC (GCIL) DRIVERS PROVIDE CAPABILITY TO CONTROL SELECTED COMM & TRACK LRU'S EITHER IN "COMMAND" MODE (GROUND COMMANDS OR KEYBOARD INPUTS) OR IN "PANEL" MODE (CREW CONTROL VIA PANEL SWITCHES). LOSS OF GCIL DRIVER OUTPUT FOR "COMM A PWR ON" WOULD DISABLE THE KU-BAND SYSTEM FOR TWO-WAY OPERATIONAL COMMUNICATIONS FOR ORBIT OPERATIONS. ESSENTIAL FUNCTIONS WOULD BE PERFORMED BY THE S-BAND PM SYSTEM. LOSS OF ALL CAPABILITY TO UPDATE STATE VECTOR VIA KU-BAND, S-BAND PM, OR UHF VOICE COULD CAUSE LOSS OF CREW/VEHICLE.

REFERENCES: SYSTEM SCHEMATICS VS70-740109, 299; SSSH 16.3;  
INCO/COMM SYSTEMS BRIEF 18; OMRSD V74 FILE III

REPORT DATE 12/31/87

C-960



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/10/87  
SUBSYSTEM: COMM AND TRACK  
MDAC ID: 11009

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 2/2  
ABORT: 3/3

ITEM: GCIL DRIVER, KU-BAND SYSTEM  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS

SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM AND TRACK
- 2) KU-BAND SYSTEM
- 3) GCIL DRIVER
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	2/2	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC450-0021-0002

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE,  
VIBRATION

EFFECTS/RATIONALE:

THE GROUND COMMAND INTERFACE LOGIC (GCIL) DRIVERS PROVIDE CAPABILITY TO CONTROL SELECTED COMM & TRACK LRU'S EITHER IN "COMMAND" MODE (GROUND COMMANDS OR KEYBOARD INPUTS) OR IN "PANEL" MODE (CREW CONTROL VIA PANEL SWITCHES). LOSS OF GCIL DRIVER OUTPUT FOR "RADAR POWER ON" WOULD DISABLE THE KU-BAND SYSTEM FOR RADAR MODE DURING ORBIT OPERATIONS. LOSS OF RADAR FOR PAYLOAD REDEZVOUS OPERATIONS COULD CAUSE LOSS OF MISSION.

REFERENCES: SYSTEM SCHEMATICS VS70-740109, 299; SSSH 16.3;  
INCO/COMM SYSTEMS BRIEF 18; OMRSD V74 FILE III

REPORT DATE 12/31/87

C-961

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/10/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK FLIGHT: 3/1R  
MDAC ID: 11010 ABORT: 3/1R

ITEM: GCIL DRIVER, CCTV SYSTEM  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W. ADDIS

BREAKDOWN HIERARCHY:

- 1) COMM AND TRACK
- 2) CCTV SYSTEM
- 3) GCIL DRIVER
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: AVIONICS BAY 3A  
PART NUMBER: MC450-0021-0002

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE,  
VIBRATION

EFFECTS/RATIONALE:

THE GROUND COMMAND INTERFACE LOGIC (GCIL) DRIVERS PROVIDE CAPABILITY TO CONTROL SELECTED COMM & TRACK LRU'S EITHER IN "COMMAND" MODE (GROUND COMMANDS OR KEYBOARD INPUTS) OR IN "PANEL" MODE (CREW CONTROL VIA PANEL SWITCHES). LOSS OF GCIL DRIVER OUTPUT FOR MNA/MNB POWER SELECTION WOULD DISABLE THE CCTV SYSTEM FOR THE AFFECTED POWER SOURCE. LOSS OF ALL CAPABILITY TO SELECT EITHER MNA OR MNB POWER FOR CCTV COULD CAUSE LOSS OF ABILITY TO STOW RMS ARM AND COULD RESULT IN LOSS OF CREW/VEHICLE.

REFERENCES: SYSTEM SCHEMATICS VS70-740189, 299; SSSH 16.1;  
INCO/COMM SYSTEMS BRIEF 16

REPORT DATE 12/31/87

C-962

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/01/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/1R  
MDAC ID: 11501 ABORT: 3/1R

ITEM: CIRCUIT BREAKER, 3A  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (GCILC)
- 2) GCIL
- 3) GCIL
- 4) CIRCUIT BREAKER, 3A MNA, CB44; MNC, CB49
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/1R	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 1 ] B [ P ] C [ P ]

LOCATION: PANEL R15  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

EACH CIRCUIT BREAKER (CB) PROTECTS ITS ASSOC. MAIN BUS (CB44-MNA, CB49-MNC) & LOAD SIDE GROUND CONTROL INTERFACE LOGIC (GCIL) CIRCUITRY, & SUPPLIES PWR FOR ONE REDUNDANT GCIL PWR SUPPLY & FOR 1 OF 2 COMMAND MODE LINES VIA EACH OF THE 5 "COMMAND/PANEL" GCIL MODE SELECTOR SWITCHES. LOSS OF ONE CB WOULD CAUSE LOSS OF OUTPUT FROM THE ASSOCIATED REDUNDANT PWR SUPPLY, BUT NO LOSS OF GCIL "COMMAND" MODE FUNCTION. LOSS OF THE OTHER CB WOULD CAUSE LOSS OF GCIL "COMMAND" CONTROL FOR MODE/CONFIG MANAGEMENT OF THE 5 ASSOCIATED COMM SYSTEMS (S-BAND'S PM, FM, & PAYLOAD, KU-BAND, CCTV). FAILURE OF "PANEL" MODE CONTROL OF THE S-BAND PM SYS PLUS FAILURE OF UHF VOICE COULD PREVENT STATE VECTOR UPDATES AFTER KU-BAND STOW & COULD RESULT IN LOSS OF CREW/VEHICLE.

REFERENCES: SSSH 16.17, SYSTEM SCHEMATIC VS70-740299

REPORT DATE 12/31/87 C-963

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/01/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: COMM AND TRACK/EPD&C FLIGHT: 3/3  
MDAC ID: 11502 ABORT: 3/3

ITEM: CIRCUIT BREAKER, 3A  
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: A.W. ADDIS SUBSYS LEAD: A.W.ADDIS

BREAKDOWN HIERARCHY:

- 1) KU-BAND (GCILC)
- 2) COMM & TRACK
- 3) GCIL
- 4) CIRCUIT BREAKER, 3A MNA, CB44; MNC, CB49
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL R15  
PART NUMBER:

CAUSES: CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION,  
MECH SHOCK, THERMAL STRESS

EFFECTS/RATIONALE:

INABILITY TO REMOVE POWER TO ONE OF THE DUAL 28 VC POWER SUPPLIES  
AND TO THE ASSOCIATED S-BAND, KU-BAND, AND TV "COMMAND/PANEL"  
MODE SELECTOR SWITCHES. DISCONNECT COULD BE PROVIDED BY THESE  
SWITCHES. THIS CB NORMALLY CLOSED THROUGHOUT MISSION.  
FAILURE WOULD HAVE NO EFFECT ON MISSION/CREW/VEHICLE.

REFERENCES: SSSH 16.17, SYSTEM SCHEMATIC VS70-740299

REPORT DATE 12/31/87

C-964

# APPENDIX D POTENTIAL CRITICAL ITEMS

MDAC-ID	FLIGHT	ITEM	FAILURE MODE
1045	2/1R	NETWORK SIGNAL PROC	OPEN (ELECTRICAL)
1046	2/1R	NETWORK SIGNAL PROC	INTERMITTENT OPERATION
1050	2/2	NSP ENCRYPTION PWR	FAILS TO REMAIN OPEN/CLOSE
1051	2/2	NSP ENCRYPTION MODE SW	FAILS TO REMAIN OPEN/CLOSE
1052	2/2	NSP ENCRYPTION MODE SW	SHORTED
1053	2/2	NSP ENCRYPTION SELECT	FAILS TO REMAIN OPEN/CLOSE
1054	2/2	NSP ENCRYPTION SELECT	OPEN (ELECTRICAL)
1056	2/2	ENCRYPTION ZEROIZE/ NORMAL SWITCH	SHORTED
1068	2/1R	UPLINK BLOCK SWITCH	FAILS TO OPEN/CLOSE
1502	3/2R	FUSE, 1A	FAILS OPEN
1504	3/2R	RESISTOR, 1.2K	FAILS OPEN
1506	3/2R	DIODE	FAILS OPEN
1508	3/2R	DIODE	FAILS OPEN
1510	3/2R	FUSE, 1A	FAILS OPEN
1512	3/2R	RESISTOR, 1.2K	FAILS OPEN
1514	3/2R	FUSE, 10A	FAILS OPEN
1516	3/2R	FUSE, 10A	FAILS OPEN
1518	3/2R	DIODE	FAILS OPEN
1521	3/1R	DIODE, A16CR1	FAILS OPEN
1522	3/1R	DIODE, A16CR2	FAILS OPEN
1555	3/2R	DIODE, A18CR12	FAILS OPEN
1607	3/1R	FUSE, 1A	FAILS OPEN
1609	3/1R	RESISTOR, 1.2K	FAILS OPEN
1612	3/1R	DIODE	FAILS OPEN
1615	3/2R	RESISTOR, 1.2K	FAILS OPEN
1618	3/2R	RPC	FAILS OPEN
1622	3/2R	RPC	FAILS OPEN
1625	3/2R	DIODE	FAILS OPEN
1627	3/2R	DIODE	FAILS OPEN
1631	3/1R	FUSE, 3A	FAILS OPEN
1633	3/1R	FUSE	FAILS OPEN
1635	3/1R	DRIVER	FAILS OPEN
1637	3/1R	DRIVER	FAILS OPEN
1639	3/1R	DIODE	FAILS OPEN
1641	3/1R	DIODE	FAILS OPEN
1643	3/1R	DIODE	FAILS OPEN
1645	3/1R	DIODE	FAILS OPEN
1647	3/1R	DIODE	FAILS OPEN
1649	3/1R	DIODE	FAILS OPEN
1651	3/1R	DIODE	FAILS OPEN
1653	3/1R	DIODE	FAILS OPEN
1655	3/1R	DIODE	FAILS OPEN
1657	3/1R	DIODE	FAILS OPEN
1659	3/1R	DIODE	FAILS OPEN

MDAC-ID	FLIGHT	ITEM	FAILURE MODE
1661	3/1R	DIODE	FAILS OPEN
1663	3/1R	DIODE	FAILS OPEN
1665	3/2R	DIODE	FAILS OPEN
1667	3/2R	DIODE	FAILS OPEN
3001	2/2	PAYLOAD ANTENNA	LOSS OF OUTPUT
3003	2/2	PAYLOAD RF TRANSFER SW	FAILS MID-TRAVEL
3004	2/2	PAYLOAD RF TRANSFER SW	SHORTED
3017	2/2	S-BAND PAYLOAD SYS SLCT	SHORTED
3019	2/2	S-BAND PL PI/PSP PWR SW	SHORTED
3021	2/2	S-BAND PL ANTENNA	SHORTED
3023	2/2	PI TRANSMITTER RF PWR	SHORTED
3025	2/2	PL SYS XMTR MODULATION	SHORTED
3027	2/2	S-BAND FREQUENCY SWEEP	SHORTED
3029	2/2	S-BAND PL PSP CMD	SHORTED
3501	3/2R	FUSE, 3A	FAILS OPEN
3503	3/2R	FUSE, 1A	FAILS OPEN
3505	3/2R	FUSE, 1A	FAILS OPEN
3507	3/2R	FUSE, 10A	FAILS OPEN
3509	3/2R	FUSE, 3A	FAILS OPEN
3512	3/2R	FUSE, 10A	FAILS OPEN
3513	3/2R	FUSE, 10A	FAILS OPEN
3516	3/2R	DIODE	FAILS OPEN
3517	3/2R	DIODE	FAILS OPEN
3519	3/2R	FUSE, 3A	FAILS OPEN
3521	3/2R	DRIVER	FAILS OPEN
3523	3/2R	DRIVER	FAILS OPEN
3526	3/2R	DRIVER	FAILS OPEN
3527	3/2R	DRIVER	FAILS OPEN
4041	1/1	KU BD ANT A PYRO	
		ARM/SAFE SW	FAILS TO SWITCH
4042	1/1	KU BD ANT A PYRO	
		ARM/SAFE SW	ELECTRICAL OPEN/SHORT
4043	1/1	KU BD ANT A PYRO	
		JETT/SAFE SW	FAILS TO SWITCH
4044	1/1	KU BD ANT A PYRO	
		JETT/SAFE SW	ELECTRICAL OPEN/SHORT
4505	2/2	CIRCUIT BREAKER, 7.5A	FAILS OPEN
4508	2/2	RPC, 10A	FAILS OPEN
4511	3/2R	FUSE, 3A	FAILS OPEN
4512	2/2	FUSE, 3A	FAILS OPEN
4513	2/2	FUSE, 3A	FAILS OPEN
4514	2/1R	CIRCUIT BREAKER, 3A	FAILS OPEN
4516	2/1R	CIRCUIT BREAKER, 3A	FAILS OPEN
4520	3/2R	CIRCUIT BREAKER, 3A	FAILS OPEN
4524	3/2R	RPC, 5A	FAILS OPEN
4527	3/2R	FUSE, 1A	FAILS OPEN
4528	3/2R	FUSE, 1A	FAILS OPEN
4535	3/2R	FUSE, 1A	FAILS OPEN

MDAC-ID	FLIGHT	ITEM	FAILURE MODE
4537	3/2R	FUSE, 1A	FAILS OPEN
4543	3/2R	RESISTOR, 1.2K	FAILS OPEN
5001	2/2	UHF EVA/ATC ANTENNA	LOSS OF OUTPUT
5003	2/2	UHF EVA/ATC TRANSCEIVER	LOSS OF OUTPUT
5005	2/2	UHF EVA/ATC TRANSCEIVER	LOSS OF OUTPUT
5010	3/1R	UHF SIMPLEX POWER SW	SHORTED
5013	2/2	UHF XMIT FREQUENCY SW	FAILS TO REMAIN OPEN/CLOSE
5502	3/2R	CB, UHF, MNC	FAILS TO REMAIN OPEN/CLOSE
5503	3/1R	CB, UHF, MNC	FAILS TO REMAIN OPEN/CLOSE
6030	2/2	DR C&W SW	SHORT TO GROUND
6033	2/2	DR/SL PAGE SW	SHORT TO GROUND
6036	2/2	DR/SL ICOM SW	SHORT TO GROUND
6039	2/2	DR/SL A/A SW	SHORT TO GROUND
6042	2/2	DR/SL A/G SW	SHORT TO GROUND
6045	2/1R	UHF A/A SW	SHORT TO GROUND
6048	2/1R	UHF A/G SW	SHORT TO GROUND
6051	2/1R	VOICE RCD SEL SW	SHORT TO GROUND
6069	2/1R	AUDIO CENTER SW	SHORT TO GROUND
7026	2/2	RENDEZVOUS RADAR	LOSS OF OUTPUT
7027	2/2	RENDEZVOUS RADAR	FAILS OUT OF TOLERANCE
7028	2/2	RR EA-1	LOSS OF OUTPUT
7029	2/2	RR EA-2	LOSS OF OUTPUT
7030	2/2	RR DEA	LOSS OF OUTPUT
7031	2/2	RR DEA	FAILS OUT OF TOLERANCE
7032	2/2	RR DMA	LOSS OF OUTPUT
7033	2/2	RR DMA	PHYSICAL BINDING/JAMMING
7034	2/2	RR DMA	FAILS TO START/STOP
7035	2/2	RR DMA	ERRATIC OPERATION
7036	2/2	KU-BAND POWER SWITCH	FAILS TO CLOSE
7037	2/2	KU-BAND POWER SWITCH	ELECTRICAL OPEN/SHORT
7038	2/2	KU-BAND POWER SWITCH	FAILS TO REMAIN CLOSED
7039	2/2	KU A MODE SWITCH	FAILS TO SWITCH
7040	2/2	KU A MODE SWITCH	ELECTRICAL OPEN/SHORT
7042	2/2	RADAR OUTPUT SWITCH	FAILS TO SWITCH
7043	2/2	RADAR OUTPUT SWITCH	ELECTRICAL OPEN/SHORT
7044	2/2	SLEW AZIMUTH CONT SW	FAILS TO SWITCH
7045	2/2	SLEW AZIMUTH CONT SW	ELECTRICAL OPEN/SHORT
7046	2/2	SLEW ELEV CONTROL SW	FAILS TO SWITCH
7047	2/2	SLEW ELEV CONTROL SW	ELECTRICAL OPEN/SHORT
8001	2/1R	VIDEO SWITCHING UNIT	LOSS OF OUTPUT
8002	2/1R	VIDEO SWITCHING UNIT	FAILS TO SWITCH
8003	2/1R	VIDEO SWITCHING UNIT	ELECTRICAL OPEN/SHORT
8004	2/1R	REMOTE CONTROL UNIT	LOSS OF OUTPUT
8005	2/1R	REMOTE CONTROL UNIT	ELECTRICAL OPEN/SHORT
8008	2/1R	TV CAMERA A	LOSS OF OUTPUT
8009	2/1R	TV CAMERA B	LOSS OF OUTPUT
8010	2/1R	TV CAMERA C	LOSS OF OUTPUT
8011	2/1R	TV CAMERA D	LOSS OF OUTPUT
8014	2/1R	PAN AND TILT UNIT	PHYSICAL BINDING/JAMMING
8015	2/1R	PAN AND TILT UNIT	FAILS TO START/STOP

MDAC-ID	FLIGHT	ITEM	FAILURE MODE
8016	2/1R	PAN AND TILT UNIT	ERRATIC/INTERMITTENT
8017	2/1R	PAN AND TILT UNIT	PHYSICAL BINDING/JAMMING
8018	2/1R	PAN AND TILT UNIT	FAILS TO START/STOP
8019	2/1R	PAN AND TILT UNIT	ERRATIC/INTERMITTENT OPER
8020	2/1R	PAN AND TILT UNIT	PHYSICAL BINDING/JAMMING
8021	2/1R	PAN AND TILT UNIT	FAILS TO START STOP
8022	2/1R	PAN AND TILT UNIT	ERRATIC/INTERMITTENT OPER
8023	2/1R	PAN AND TILT UNIT	PHYSICAL BINDING/JAMMING
8024	2/1R	PAN AND TILT UNIT	FAILS TO START/STOP
8025	2/1R	PAN AND TILT UNIT	ERRATIC/INTERMITTENT OPER
8033	2/1R	MONOCHROME LENS ASSY	LOSS OF OUTPUT
8034	2/1R	MONOCHROME LENS ASSY	PHYSICAL BINDING/JAMMING
8035	2/1R	MONOCHROME LENS ASSY	LOSS OF OUTPUT
8036	2/1R	MONOCHROME LENS ASSY	PHYSICAL BINDING/JAMMING
8037	2/1R	MONOCHROME LENS ASSY	LOSS OF OUTPUT
8038	2/1R	MONOCHROME LENS ASSY	PHYSICAL BINDING/JAMMING
8039	2/1R	MONOCHROME LENS ASSY	LOSS OF OUTPUT
8040	2/1R	MONOCHROME LENS ASSY	PHYSICAL BINDING/JAMMING
8053	2/1R	COLOR LENS ASSEMBL	LOSS OF OUTPUT
8054	2/1R	COLOR LENS ASSEMBLY	PHYSICAL BINDING/JAMMING
8055	2/1R	COLOR LENS ASSEMBLY	LOSS OF OUTPUT
8056	2/1R	COLOR LENS ASSEMBLY	PHYSICAL BINDING/JAMMING
8057	2/1R	COLOR LENS ASSEMBLY	LOSS OF OUTPUT
8058	2/1R	COLOR LENS ASSEMBLY	PHYSICAL BINDING/JAMMING
8059	2/1R	COLOR LENS ASSEMBLY	LOSS OF OUTPUT
8060	2/1R	COLOR LENS ASSEMBLY	PHYSICAL BINDING/JAMMING
8067	2/1R	CONSOLE MONITOR	LOSS OF OUTPUT
8068	2/1R	CONSOLE MONITOR (CRT)	LOSS OF CRT
8069	2/1R	TV PWR CNTL UNIT SW	FAILS TO SWITCH
8070	2/1R	TV PWR CNTL UNIT SW	ELECTRICAL OPEN/SHORT
8074	2/1R	TV SYNC SWITCH	ELECTRICAL OPEN/SHORT
8077	2/1R	TV CAMERA POWER SW	FAILS TO SWITCH
8078	2/1R	TV CAMERA POWER SW	ELECTRICAL OPEN/SHORT
8079	2/1R	TV CAMERA POWER SW	FAILS TO SWITCH
8080	2/1R	TV CAMERA POWER SW	ELECTRICAL OPEN/SHORT
8081	2/1R	TV CAMERA POWER SW	FAILS TO SWITCH
8082	2/1R	TV CAMERA POWER SW	ELECTRICAL OPEN/SHORT
8083	2/1R	TV CAMERA POWER SW	FAILS TO SWITCH
8084	2/1R	TV CAMERA POWER SW	ELECTRICAL OPEN/SHORT
8095	2/1R	TV CAMERA CMD FOCUS SW	FAILS TO SWITCH
8096	2/1R	TV CAMERA CMD FOCUS SW	ELECTRICAL OPEN/SHORT
8097	2/1R	TV CAMERA CMD ZOOM SW	FAILS TO SWITCH
8098	2/1R	TV CAMERA CMD ZOOM SW	ELECTRICAL OPEN/SHORT
8099	2/1R	TV CAMERA CMD IRIS SW	FAILS TO SWITCH
8100	2/1R	TV CAMERA CMD IRIS SW	ELECTRICAL OPEN/SHORT
8101	2/1R	TV CAMERA CMD TILT SW	FAILS TO SWITCH
8102	2/1R	TV CAMERA CMD TILT SW	ELECTRICAL OPEN/SHORT
8103	2/1R	TV CAMERA CMD PAN SW	FAILS TO SWITCH
8104	2/1R	TV CAMERA CMD PAN SW	ELECTRICAL OPEN SHORT
8106	2/1R	TV CAMERA PANTILT SW	ELECTRICAL OPEN/SHORT



MDAC-ID	FLIGHT	ITEM	FAILURE MODE
-----	-----	-----	-----
8123	2/1R	TV VIDEO INPUT PBI	FAILS TO SWITCH
8124	2/1R	TV VIDEO INPUT PBI	ELECTRICAL OPEN/SHORT
8125	2/1R	TV VIDEO INPUT PBI	FAILS TO SWITCH
8126	2/1R	TV VIDEO INPUT PBI	ELECTRICAL OPEN/SHORT
8127	2/1R	TV VIDEO INPUT PBI	FAILS TO SWITCH
8128	2/1R	TV VIDEO INPUT PBI	ELECTRICAL OPEN/SHORT
8129	2/1R	TV VIDEO INPUT PBI	FAILS TO SWITCH
8130	2/1R	TV VIDEO INPUT PBI	ELECTRICAL OPEN/SHORT
8243	2/1R	TVC A MONOCHROME LENS	FAILS TO SWITCH
8244	2/1R	TVC A MONOCHROME LENS	ELECTRICAL OPEN/SHORT
8245	2/1R	TVC B MONOCHROME LENS	FAILS TO SWITCH
8246	2/1R	TVC B MONOCHROME LENS	ELECTRICAL OPEN/SHORT
8247	2/1R	TVC C MONOCHROME LENS	FAILS TO SWITCH
8248	2/1R	TVC C MONOCHROME LENS	ELECTRICAL OPEN/SHORT
8249	2/1R	TVC D MONOCHROME LENS	FAILS TO SWITCH
8250	2/1R	TVC D MONOCHROME LENS	ELECTRICAL OPEN/SHORT
8259	2/1R	TVC A MONOCHROME LENS	FAILS TO SWITCH
8260	2/1R	TVC A MONOCHROME LENS	ELECTRICAL OPEN/SHORT
8261	2/1R	TVC B MONOCHROME LENS	FAILS TO SWITCH
8262	2/1R	TVC B MONOCHROME LENS	ELECTRICAL OPEN/SHORT
8263	2/1R	TVC C MONOCHROME LENS	FAILS TO SWITCH
8264	2/1R	TVC C MONOCHROME LENS	ELECTRICAL OPEN/SHORT
8265	2/1R	TVC D MONOCHROME LENS	FAILS TO SWITCH
8266	2/1R	TVC D MONOCHROME LENS	ELECTRICAL OPEN/SHORT
8275	2/1R	TVC A MONOCHROME LENS	FAILS TO SWITCH
8276	2/1R	TVC A MONOCHROME LENS	ELECTRICAL OPEN/SHORT
8277	2/1R	TVC B MONOCHROME LENS	FAILS TO SWITCH
8278	2/1R	TVC B MONOCHROME LENS	ELECTRICAL OPEN/SHORT
8279	2/1R	TVC C MONOCHROME LENS	FAILS TO SWITCH
8280	2/1R	TVC C MONOCHROME LENS	ELECTRICAL OPEN/SHORT
8281	2/1R	TVC D MONOCHROME LENS	FAILS TO SWITCH
8282	2/1R	TVC D MONOCHROME LENS	ELECTRICAL OPEN/SHORT
8303	2/1R	TVC A COLOR LENS ASSY	FAILS TO SWITCH
8304	2/1R	TVC A COLOR LENS ASSY	ELECTRICAL OPEN/SHORT
8305	2/1R	TVC A COLOR LENS ASSY	FAILS TO SWITCH
8306	2/1R	TVC A COLOR LENS ASSY	ELECTRICAL OPEN/SHORT
8307	2/1R	TVC A COLOR LENS ASSY	FAILS TO SWITCH
8308	2/1R	TVC A COLOR LENS ASSY	ELECTRICAL OPEN/SHORT
8309	2/1R	TVC B COLOR LENS ASSY	FAILS TO SWITCH
8310	2/1R	TVC B COLOR LENS ASSY	ELECTRICAL OPEN/SHORT
8311	2/1R	TVC B COLOR LENS ASSY	FAILS TO SWITCH
8312	2/1R	TVC B COLOR LENS ASSY	ELECTRICAL OPEN/SHORT
8313	2/1R	TVC B COLOR LENS ASSY	FAILS TO SWITCH
8314	2/1R	TVC B COLOR LENS ASSY	ELECTRICAL OPEN/SHORT
8315	2/1R	TVC C COLOR LENS ASSY	FAILS TO SWITCH
8316	2/1R	TVC C COLOR LENS ASSY	ELECTRICAL OPEN/SHORT
8317	2/1R	TVC C COLOR LENS ASSY	FAILS TO SWITCH
8318	2/1R	TVC C COLOR LENS ASSY	ELECTRICAL OPEN/SHORT
8319	2/1R	TVC C COLOR LENS ASSY	FAILS TO SWITCH
8320	2/1R	TVC C COLOR LENS ASSY	ELECTRICAL OPEN/SHORT

MDAC-ID	FLIGHT	ITEM	FAILURE MODE
8321	2/1R	TVC D COLOR LENS ASSY	FAILS TO SWITCH
8322	2/1R	TVC D COLOR LENS ASSY	ELECTRICAL OPEN/SHORT
8323	2/1R	TVC D COLOR LENS ASSY	FAILS TO SWITCH
8324	2/1R	TVC D COLOR LENS ASSY	ELECTRICAL OPEN/SHORT
8325	2/1R	TVC D COLOR LENS ASSY	FAILS TO SWITCH
8326	2/1R	TVC D COLOR LENS ASSY	ELECTRICAL OPEN/SHORT
8363	2/1R	CONSOLE MNTR PWR SW	FAILS TO SWITCH
8364	2/1R	CONSOLE MNTR PWR SW	OPEN/SHORT
8368	2/1R	CONSOLE MNTR SYNC SW	OPEN/SHORT
8374	2/1R	CONSOLE MNTR SOURCE SW	OPEN/SHORT
8376	2/1R	CONSOLE MNTR BRIGHT	OPEN/SHORT
8501	2/1R	RCU 3A CB	FAILS OPEN
8503	2/1R	MON 3A CB	FAILS OPEN
8505	2/1R	CB 39 FWD BAY TVC	FAIL OPEN
8507	2/1R	CB 40 FWD BAY TVC HTR	FAIL OPEN
8509	2/1R	CB 41 FWD BAY P/T HTR	FAIL OPEN
8511	2/1R	CB 34 AFT BAY TVC	FAIL OPEN
8513	2/1R	CB 35 AFT BAY TVC HTR	FAIL OPEN
8515	2/1R	CB 36 AFT BAY P/T HTR	FAIL OPEN
8517	2/1R	CB 45 KEEL/EVA TVC	FAIL OPEN
8519	2/1R	CB 46 KEEL/EVA TVC HTR	FAIL OPEN
8521	2/1R	CB 47 KEEL/EVA P/T HTR	FAIL OPEN
8525	2/1R	CB 51 STBD RMS TVC	FAIL OPEN
8527	2/1R	CB 52 STBD RMS TVC HTR	FAIL OPEN
8529	2/1R	CB 53 STBD RMS P/T HTR	FAIL OPEN
8531	2/1R	CB 55 PORT RMS TVC	FAIL OPEN
8533	2/1R	CB 56 PORT RMS TVC HTR	FAIL OPEN
8535	2/1R	CB 57 PORT RMS P/T HTR	FAIL OPEN
10502	1/1	EMU/TV-BATTERY PACK	VENTING/EXPLOSION
11007	2/1R	GCIL DRIVER	LOSS OF OUTPUT
11009	2/2	GCIL DRIVER	LOSS OF OUTPUT